DISSERTATION TITLED

"PULMONARY MANIFESTATIONS IN SYSTEMIC LUPUS ERYTHEMATOSUS"

Submitted in partial fulfilment of

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BRANCH-I GENERAL MEDICINE

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CERTIFICATE

This is to certify that the dissertation entitled " **A STUDY ON PULMONARY MANIFESTATIONS IN SYSTEMIC LUPUS ERYTHEMATOUS** " is a bonafide work done by **DR. Y.N.NARAYANASWAMY**, Post Graduate Student, Institute of Internal Medicine, Madras Medical College, Chennai-3, in partial fulfillment of the University Rules and Regulations for the award of MD Branch – I General Medicine, under our guidance and supervision, during the academic year 2010 - 2013.

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DECLARATION

I solemnly declare that the dissertation entitled "**A STUDY ON PULMONARY MANIFESTATIONS IN SYSTEMIC LUPUS ERYTHEMATOSUS"** is done by me at Madras Medical College, Chennai-3 during May 2012 to November 2012 under the guidance and supervision of Prof .N.RAGHU, M.D., to be submitted to The Tamilnadu Dr M.G.R Medical University towards the partial fulfillment of requirements for the award of M.D DEGREE IN GENERAL MEDICINE BRANCH-I.

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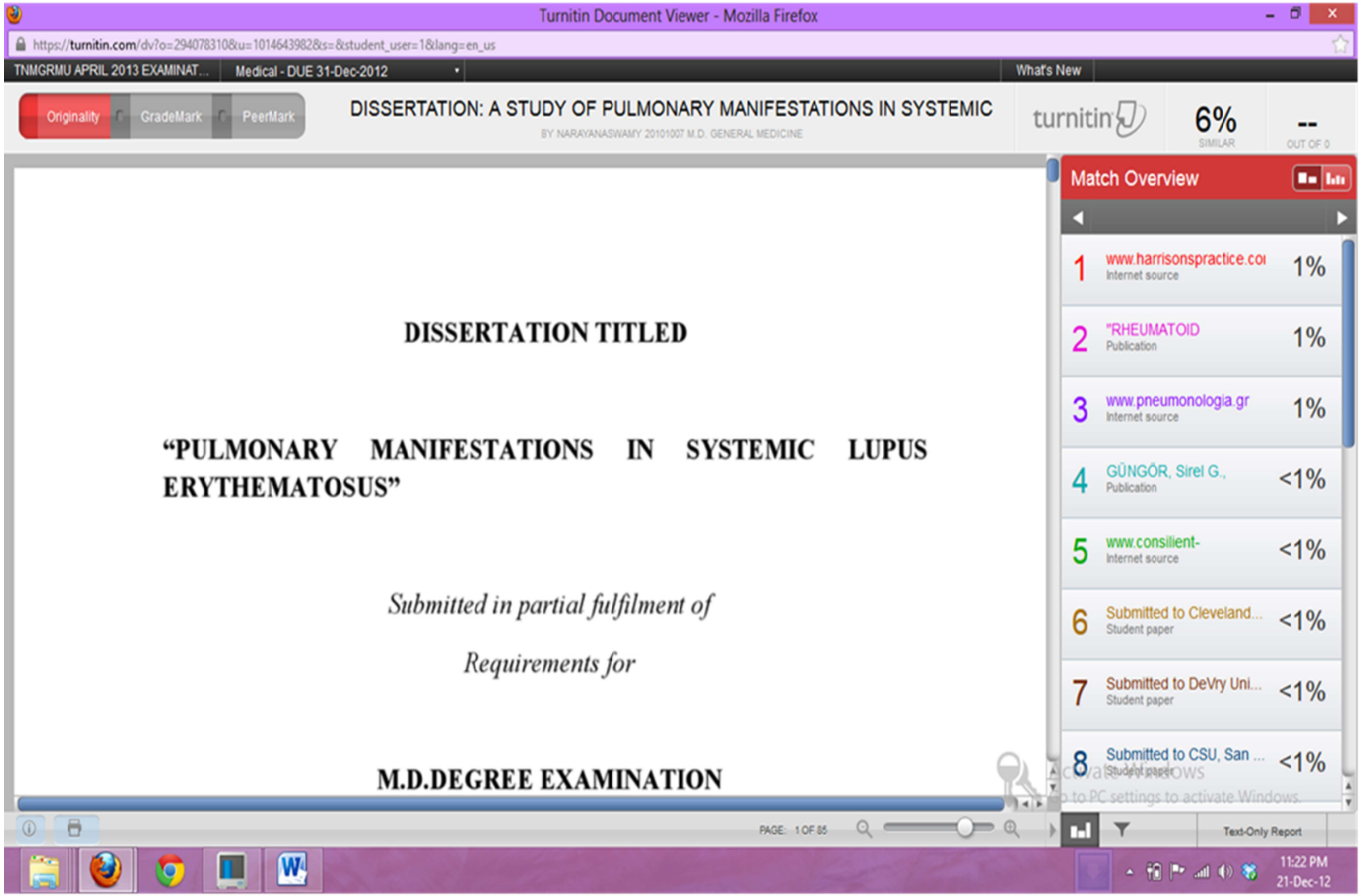
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ABBREVATIONS

SLE	Systemic Lupus Erythematosus
ANA	Anti-Nuclear Anti-bodies
EBV	Epstein Barr Virus
HRCT	High Resolution Computed Tomography
ILD	Interstitial Lung Disease
PFT	Pulmonary Function Test
SCLE	Sub-acute Cutaneous Lupus Erythematosus
CXR	Chest X Ray
CRP	C - reactive protein
RF	Rheumatoid Factor
ACL	Anti-cardiolipin anti-body
IVIg	Intravenous Immunoglobulin
APL	Anti Phospholipid

CONTENTS

INTRODUCTION

Systemic Lupus Erythematosus is one of the major causes of morbidity for a decade of life and mortality. SLE is a chronic auto immune disease characterized by microvascular Inflammation with the generation of auto antibodies that can affect almost any organ system.

Its presentation and course are highly variable SLE and pulmonary manifestations.

The majority of patients with SLE develop pleural or pulmonary disease. In the course of their illness, diagnosed clinically and or by images technique. The pleura are the most common thoracic localization of SLE.

Record studies with the use of imaging techniques like HRCT chest suggest that not only pleural diseases are common but airway disease lymphadenopathy and interstitial lung diseases are also common than previously thought.

HRCT will also be useful in permitting invasive procedures like lung biopsy and bronchodilator lavage to specific site of interest.

AIM OF THE STUDY

- To study various pulmonary involvement in Systemic lupus erythematosus

REVIEW OF LITERATURE

SLE is an auto immune disease in where autoantibodies and immune complexes may destroy organs and tissue by binding to cells.

Auto antibodies can be present without clinical manifestations initially in early stages of the disease.

It most commonly occurs in females more than males. It most commonly occurs in the women of child bearing age.

As far as race is concerned, it is more common in black women.

Pathogenesis and Etiology

It is due to interactions between susceptibility genes and environmental factors results[4]. In immune responses, this will be abnormal and vary among different patients.

Those immune responses may include: [4]

1. Innate immunity can be activated by various DNA complexes and RNA of viral origin and other origins
2. Threshold for abnormal activation pathway appear to be reduced. In adoptive immunity cells (T and B lymphocytes).
3. Ineffective regulatory CD4 and CD8 T cells.

4. Reduced clearance of immune complexes and of atopic cells.

5. Self antigens are exposed in surface blebs of apoptotic cells.

6. Example – Nucleosomal DNA / Protein, RNA / protein. In SM, RO and La, phospholipids.

7. Thus self-antigen, autoantibodies and immune complex exists for longer periods of time, allowing inflammation and disease to develop.

8. Immune cells activation is accompanied by increased secretion of cytokines.

9. In the setting of chronic inflammation → Accumulation of growth factors and products of chronic oxidation contribute to irreversible tissue damage, including fibrosis sclerosis, in glomeruli, arteries, brain, lungs and other tissues.

10. In effect of micro (mi) RNAs on gene transcription, as well as post transcriptional epigenetic modification of DNA, which is hypo methylated in SLE, also contribute to diseases susceptibilities.

11. Female sex is permissive for SLE with evidence of hormone effects. Genes on the X chromosome and epigenetic differences between genders playing a role.

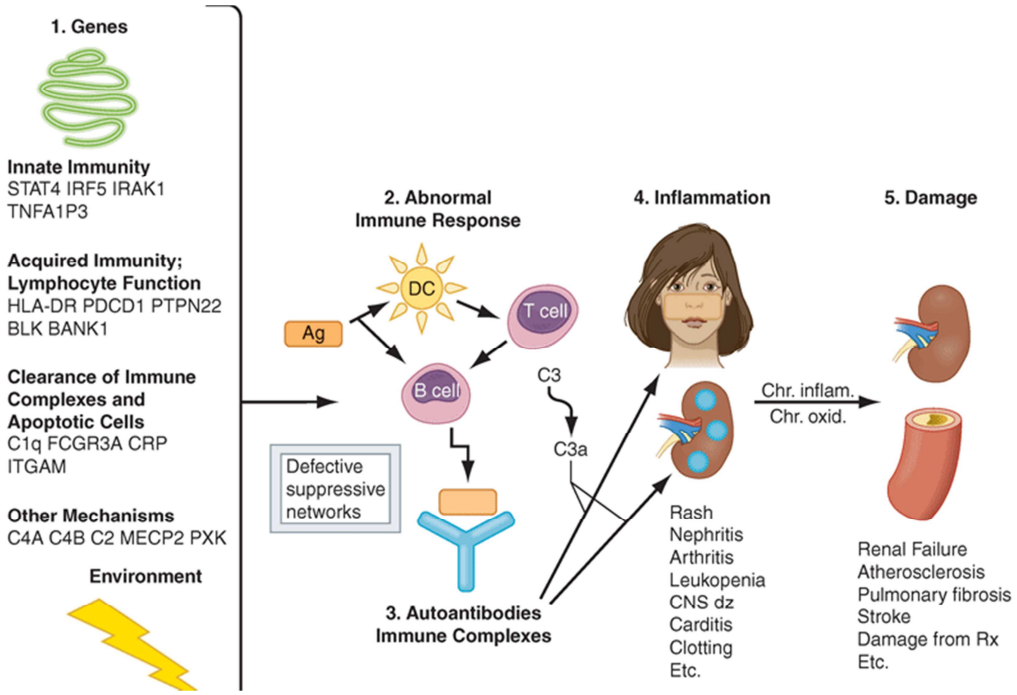
12. Women exposed to estrogen containing oral contraceptives or HRT have an increased risk of developing SLE.

13. Klinefelter's syndrome patients have a significantly increased risk for SLE.

Environmental stimuli[4]

1. UV light
2. EBV
3. Silica dust
4. Smoking

In SLE patients auto antibodies will be present for more than three years before the appearance of first clinical symptoms.



Pathology

Histopathological examination of the biopsies of the affected site like skin shows deposition of immune complexes at the dermal epidermal junction, basal keratinocytes injury and T cells, inflammatory cell on the DEJ and surrounding blood vessels and dermal layers.

Various autoantibodies in Systemic Lupus Erythematosus

1. Antinuclear antibodies (98) – ANA – Antigen recognized is multiple nuclear.
2. Anti-ds DNA(70) – Antigen recognized DNA (Double stranded)
3. Anti RNP (40) – Antigen recognized – protein complexed to U1 RNA
4. Anti SM (25) – protein complexed to 6 pieces of nuclear U1 RNA
5. Anti RO (SS-A) (30) – Protein complexed to hY RNA, primarily 60KDa and 52kDa.
6. Anti LA (SS-B) (10) – 47 KDa protein complexed to hY RNA
7. Antihistone (70) – Histones associated with DNA (in nucleosome, chromatin)
8. Antiphospholipid (50) – Phospholipids, Beta 2 glycoprotein cofactor, prothrombin.
9. Antierythrocyte (60) – Erythrocyte membrane.
10. Antiplatelet (30) – Surface and altered cytoplasms antigens on platelets.

11. Antineuronal (includes anti-glutamate) receptors – Neuronal and lymphocyte surface antigens.
12. Antiribosomal P (20)-Protein in ribosomes.

Diagnosis:

SLE diagnosis is based on typical clinical features and autoantibodies.

- Malar rash:
- Discoid rash:
- Photosensitivity
- Oral ulcers
- Arthritis: non-erosive
- Serositis: pleuritis or pericarditis
- Renal disorder:
- Neurologic disorder:
- Hematologic disorder:
- Immunologic disorder:
- Antinuclear antibodies:

Any combination of greater than or equal to 4 of 11 criteria, well documented at any time during an individual's history, makes it likely that the patient has SLE.

Diagnostic criteria specificity 95% and sensitivity 75%.[4]

ANAs are positive in 98% patients during course of the disease.[4]

Positive for many autoantibodies in an individual without clinical manifestation should not be considered diagnostic for Systemic lupus erythematosus, although such persons are at greater risk to develop systemic lupus erythematosus.

Clinical manifestations of SLE

Systemic Manifestation

It can be in the form of fatigue, malaise, fever, and anorexia or weight loss. Severe systemic illness requiring corticosteroid therapy can occur with fever, prostration, weight loss, and anemia with or without other organ targeted manifestation

Musculoskeletal manifestations

Most patients in SLE have

- Intermittent polyarthritis-varying from minimal to disabled severely, characterized by swelling of soft tissue and joint tenderness, usually involving in hands, wrists, and knees. It is usually non erosive polyarthritis[4]
- Arthralgia, myalgia
- Joint deformities can develop in hands and feet in about 10% of patients
- Myopathy/Myositis- myositis with clinical muscle weakness, elevated creatine kinase levels, positive MRI scan, and necrosis of muscle and muscle inflammation on biopsy can be seen, although most patients have myalgia without frank myositis
- Ischemic necrosis of bone- it should be considered particularly if there are no other manifestations of active SLE and pain persisting as monoarthritis usually involving, such as knee, shoulder, or hip. The prevalence of ischemic necrosis of bone is increasing due to use of systemic glucocorticoid in SLE
- Muscle Weakness- it can occur as a result of glucocorticoid therapies most commonly and antimalarial therapies rarely. And

it can also occur in active disease per se it's important to distinguish.

Cutaneous manifestations*:* lupus dermatitis can be classified as follows

- Discoid lupus erythematosus(DLE)
- Systemic rash
- Sub-acute cutaneous lupus erythematosus(SCLE) or other

Discoid lesions are approximately circumscribed lesion with lightly elevated, scaly hyper pigmented erythematous rims and DE pigmented, thin centers in which all dermal layers are permanently destroyed. Lesions will be disfigured and especially located on head and neck areas. Treatment consists of topical glucocorticoid and systemic antimalarial

Other manifestations as follows

- Photosensitivity
- Malar rash
- Oral ulcers
- Alopecia
- Vasculitic rash

- Others (eg : urticarial, subacute cutaneous lupus)

Most common cutaneous manifestation is photosensitive, slightly raised, erythematous, occasionally, on the face, head and neck region, over chest and extensor surface of arm.

Renal manifestations:

Nephritis is most dangerous manifestation of systemic lupus erythematosus, particularly in first decade of onset of disease nephritis and infection form the major cause of death

Since most of the cases of nephritis are asymptomatic it is important to do urine analysis in all suspected cases of SLE

Classification of lupus nephritis:

1. Minimal mesangial lupus nephritis
2. Mesangial proliferative lupus nephritis
3. Focal lupus nephritis
4. Diffuse lupus nephritis
5. Membranous lupus nephritis
6. Advanced sclerotic lupus nephritis

Renal biopsy is useful in planning current and future therapies. Patients with dangerous proliferative forms belonging to class 3 and 4 usually have microscopic hematuria and proteinuria (>500mg per 24 h); approximately one-half develop nephrotic syndrome, and hypertension. If diffuse nephritis not treated, almost all patients develop End Stage Renal Disease within first two years of diagnosis. Therefore aggressive immunosuppression is indicated usually systemic glucocorticoids and cytotoxic drugs, unless 90% of glomeruli have irreversible damage[26]

Blacks are more likely to develop ESRD than whites

Neurologic manifestations:

There are many CNS and peripheral nervous system involvement in SLE, in some patients these are major cause of morbidity and death.it is important diagnose whether manifestation due to SLE or another condition such as infection in immunosuppressed individuals [4]

If symptoms related to SLE or vascular occlusive disease should be differentiated

- Cognitive disorder-it is the most common finding of diffuse CNS lupus including difficulties in memory and reasoning.

- Mood disorder-Psychosis sometimes may be dominant manifestation; it must be differentiated from glucocorticoid induced psychiatric manifestation which usually occurs in first week of glucocorticoid therapy if daily doses of prednisolone more than 40 mg or equivalent
- Headaches are also common
- Seizures
- Mono- and polyneuropathy
- Stroke, TIA
- Acute confusional state or movement disorder
- Aseptic meningitis-as a complication of NSAIDS Therapy
- Myelopathy- is not rare

Hematologic manifestations:

- Anemia-it is the most frequent hematological manifestation of SLE usually normocytic normochromic reflecting chronic illness, or due to RBC lysis can be fast in onset and more pronounced requiring high dose glucocorticoid[4]

- Leukopenia (<4000/µl) is also common and associated with lymphopenia, but not granulocytopenia
- Lymphopenia (<1500/µl)
- Thrombocytopenia (<100000/µl)-it may be recurring problem. If platelet count above 40000/µl an abnormal bleeding absent, therapy may not be required. High dose glucocorticoid is usually useful in first few episodes of low platelet counts
- Lymphadenopathy
- Splenomegaly
- Hemolytic anemia- Recurring or prolonged hemolytic anemia ,requiring high dose glucocorticoid should be treated with an additional strategy

Vascular occlusions-

The rate of occurrence of, TIA, strokes, and, Coronary artery disease is increased in SLE patients

SLE patient with antibodies to phospholipid (APL) are associated with hypercoagulability and acute thrombotic events

Ischemia in the brain can be caused by focal occlusion (either non inflammatory or associated with vasculitis) or by embolization from carotid artery plaques or from fibrinous vegetation's of Libman-Sacks endocarditis[4]

IT can affect vascular system as follows

- Arterial thrombosis
- Venous thrombosis
- Accelerated atherosclerosis-characteristic associated with higher rate of progression for atherosclerosis include old age, systemic hypertension, hypercholestremia, dysfunctional proinflammatory high-density lipoproteins, repeated high scores for disease activity, high cumulative doses of glucocorticoid, and high levels of homocysteine.

Statins therapies reduce levels of LDL in SLE patients

SLE patient with positive antiphospholipid antibody:

If a patient with SLE who had history of repeated fetal losses associated with venous clotting or arterial clotting and at least 2 positive test for aPL have APS and should be managed with long term anticoagulation with

- INR of 2-2.5 is recommended for patients with history of one episode of venous clotting[4]
- INR of 3-3.5 is recommended for patients with recurring clots or arterial clotting particularly[4]

Gastrointestinal manifestations:-

- Non-specific (nausea, mild pain, diarrhea)
- Abnormal liver enzymes-increases in serum (AST and ALT) are seen mostly when SLE flare present.
- Vasculitis- involving intestine may be severe manifestation; perforations of intestine, ischemia, bleeding, and sepsis are frequent complications
- Autoimmune peritonitis- It can manifest as diffuse abdominal pain

Aggressive immunosuppressive treatment with large dose glucocorticoids for short period control; evidence of recurrence is an indication for additional therapies

Ocular manifestations:

- Sicca syndrome-are common manifestation in SLE

- Conjunctivitis- usually non specific
- Episcleritis
- Vasculitis- involving retinal vessel and optic neuritis are serious manifestation; loss of vision can develop over days to weeks

Cardiac manifestations:

- Pericarditis- it is the most common cardiac manifestation; it usually relived corticosteroid therapy and infrequently leads to tamponade
- Pericardial effusions
- Myocarditis-it is proven to improve on glucocorticoid or other immunosuppressive therapies
- Libman-Sacks endocarditis- most serious cardiac manifestation can lead to valvular insufficiencies
- Coronary artery disease

Along with steroids, other supportive therapy for heart failure, treatment for arrhythmia, and embolic events

Pulmonary manifestations: (4, 5,)

Systemic lupus erythematosus, the entire pulmonary system is susceptible to injury. Any of pulmonary parts—airways, lung parenchyma, along with vasculature, pleura, or the respiratory musculature—may be separately or simultaneously affected.

The pulmonary manifestations are thought to be the result of an immune complex mediated injury

Most common pulmonary manifestation of SLE is pleural involvement either in the form of pleuritis with or without pleural effusion[4]

Other manifestations are

- Pulmonary infections
- Airway diseases
- Acute lupus pneumonitis
- Pulmonary alveolar hemorrhage
- Shrinking lung syndrome
- Interstitial lung diseases
- Fibrosis

- Pulmonary hypertension
- Pulmonary embolism
- Mediastinal lymphadenopathy
- Organizing pneumonia

Pleural involvement:

Pleuritic pain with or without effusion is the most common manifestation of SLE, occurring majority of SLE patients. Pleurisy and pleural effusion may be the presenting and sole manifestation of disease. They are usually recurrent and may accompany more severe complications such as acute lupus pneumonitis or nephritis. Clinical features: chest pain, dyspnea, cough and fever. The chest radiograph may be normal-Dry pleurisy, or may demonstrate small to moderate effusion may be bilateral or unilateral. When unilateral there is no predilection for either side[5]

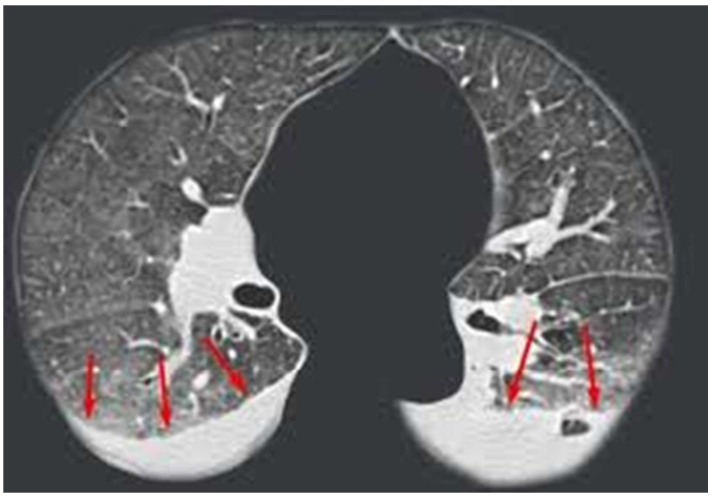
Effusions are serous or serosanguineous and exudative in nature. A positive double stranded pleural fluid DNA titer is nonspecific as opposed to the serum test, since it is found in pleural fluid in effusion due to malignancy and tuberculosis.

The most useful measurement in pleural fluid is pleural fluid ANA titer. Levels greater than 1:160 are very suggestive of lupus pleuritis[14]

Histopathology of the pleural tissue shows infiltrated with cells, and, with repeated episodes, pleural fibrosis supervenes[12]. Occasionally, a vasculities of the pleural vessels is detected, and immune complex deposition has been reported

Corticosteroid treatment is effective for relief of pleural pain, but time to resolution of the pleural effusion is variable and probably unaffected by this treatment. In the unusual case, recurrent lupus pleuritis may result in massive pleural fibrosis and lung entrapment, necessitating a pleural stripping procedure[5]

Differential diagnosis for pleuritis and pleural effusion includes infectious complications, thromboembolic disease, and Para pneumonic effusion, congestive heart failure, and effusion secondary to thromboembolic disease



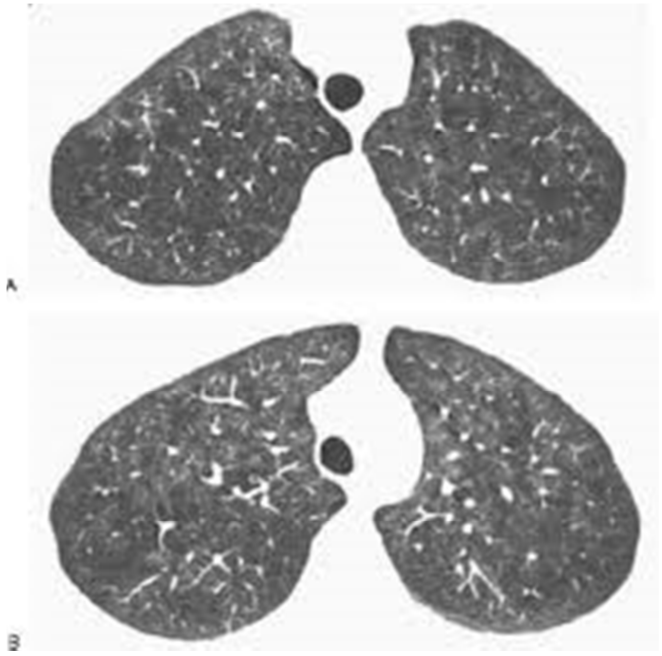
Acute lupus pneumonitis: [8]

Acute lupus pneumonitis is a clinical syndrome with an underlying histology of diffuse alveolar damage (DAD) bronchiolitis obliterans organizing pneumonia, NSIP, or a combination of these. It mimics acute infectious pneumonia and may be presenting manifestation of SLE in up to 50 percent of cases. In those with an established with an established diagnosis, it also appears during a flare-up of other systemic manifestation of SLE particularly pleuritis, pericarditis, arthritis, and nephritis. It is reportedly most common in postpartum period. It recurs and can progress to ILD[9]

It is associated with variable degree of respiratory impairment accompanied by focal or diffuse pulmonary consolidation and often accompanied by pleural effusion and cardiomegaly due to underlying pericardial effusion or myocarditis, are present in chest X ray at presentation

Because of the difficulty in distinguishing acute lupus pneumonitis from an infectious pneumonia, a bronchoalveolar lavage and sometimes an open lung biopsy are indicated prior to instituting anti-inflammatory and immunosuppressive therapy

Acute respiratory failure in acute lupus pneumonitis often requires assisted mechanical ventilation. The mortality due to this is high, with cause of death being either respiratory failure, another complication of SLE, or a superimposed infection[5]



Diffuse alveolar hemorrhage: [22, 23, 24, and 25]

Diffuse alveolar hemorrhage, although rare may be presenting manifestation of SLE. In majority of cases it occurs in well documented cases of SLE

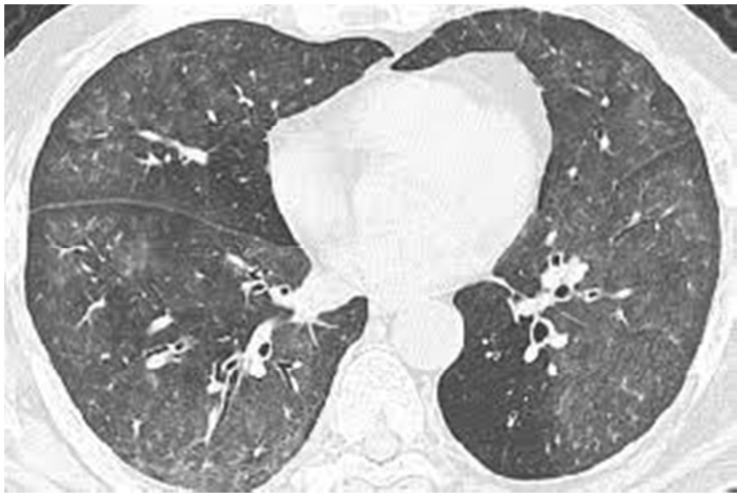
It can also present with symptoms reminiscent of an infectious pneumonia or acute lupus pneumonitis, and additional symptoms of hemoptysis raises the possibility of this diagnosis. Hemoptysis can be present in 90 percent of people during the course of diffuse alveolar hemorrhage

Routine work up shows a falling hematocrit, and in 60 to 90 percent of patients an active glomerulonephritis is invariably present. A progressive serosanguineous bronchoalveolar lavage may be the first clue to this diagnosis

In CT chest it usually appears as both lung infiltrates ranging from minimal ground glass opacities to dense consolidation It can be diffuse or patchy[1, 2]

Pathological changes that are reminiscent of both acute lupus pneumonitis and diffuse alveolar hemorrhage with or without pulmonary capillaritis are not unusual in a single biopsy specimen. The mortality rate is very high

Treatment once infection is ruled out is corticosteroid which is the main stay of treatment. IV methylprednisolone in the dose of 1 to 2 gram per day for 3 to 4 days followed by tapering should be considered. Concomitant oral or parenteral cyclophosphamide or azathioprine is commonly administered, given the incidence of lupus nephritis



Pulmonary fibrosis

It is due to chronic interstitial pulmonary disease. In more recent studies using HRCT many asymptomatic patients of SLE with normal chest x ray demonstrated pulmonary abnormalities consistent with some form of ILD. In those who develop ILD insidious onset of dyspnea are noted. The incidence of ILD in SLE is increasing in some of SLE patients with features suggestive of a mixed connective tissue disease

In patient who develop the slowly progressive form of ILD, the diagnosis of SLE is present for many years, and no other pattern of organ involvement predicts its appearance

These patients have progressive dyspnea and cough with interstitial infiltration in chest radiograph

In HRCT chest it appears as honeycombing changes with peripheral and basal predominance, linear thickened interlobular septae, ground glass attenuation and parenchymal bands

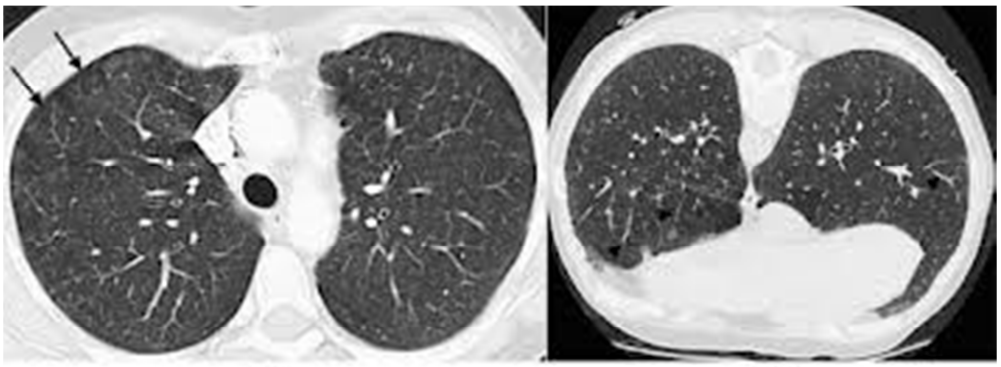
PFTs reveal a restrictive pattern with reduction in the diffusion capacity and hypoxia accentuated by exercise.

Responses to therapy either corticosteroid alone or in combination with cyclophosphamide or azathioprine, depends upon underlying histology. Those with underlying Nonspecific interstitial pneumonitis or organizing pneumonia are more likely to respond to treatment than those who demonstrate excess collagen deposition and cystic honeycomb formation

Lymphocytic interstitial pneumonia:

In HRCT scan it may reveal ground glass opacity, poorly defined centrilobular nodular, thickening of bronchovascular bundle, interlobular septal and cystic airspaces

Patchy alveolar infiltrates



Bronchiolitis

Few patients of SLE are reported to have obstructive physiology. Obliterative bronchiolitis has been documented in SLE, but is rare in contrast to rheumatoid arthritis. Bronchiectasis may occur in up to 20 percent of patients but is often asymptomatic. Large airway involvement including tracheal and subglottic stenosis, vocal cord paralysis, epiglottitis, and necrotizing tracheitis have all been reported but are rare

Pulmonary hypertension:

Idiopathic pulmonary hypertension due to plexogenic arteriopathy is estimated to occur in 1 to 9 percent of patients. This form of patients associated with Raynaud phenomenon, digital vasculitis, and serositis, antibodies to ribonucleoprotein, rheumatoid factor, antiphospholipid antibodies, and most recently anti-endothelial antibodies. Patient complains of dyspnea and fatigue but have normal chest x ray. Few cases can result in right heart failure. In advanced cases, pulmonary arterial enlargement appears

Spirometry and lung volumes are normal, but there is often an isolated reduction of the diffusing capacity for CO as well as gas exchange abnormalities.

Ventilation-perfusion lung scanning and, occasionally, pulmonary arteriography are indicated, particularly in those patient with antiphospholipid antibody syndrome who have a potential for recurrent small pulmonary emboli

In HRCT chest dilated main pulmonary artery, abnormalities in perfusion, heterogeneity of lung attenuation[1, 2]

Therapeutic option include vasodilator therapy, anticoagulation, immunosuppression with cyclophosphamide, and transplantation

Pulmonary embolism:

It is mostly associated with SLE with antiphospholipid syndrome. The most common epitope(s) to which antibodies exists in these patients is ß2-glycoprotien I. A more appropriate term may therefore be anti-ß2-glycoprotien syndrome. Up to a third of patients with SLE have antiphospholipid syndrome

Chronic pulmonary embolism can lead to pulmonary hypertension

Pulmonary infections:

It is usually due to SLE and secondary immunosuppression or as a result of complication of corticosteroid and immunosuppressant treatment. Any patient with SLE who presents with a febrile illness, cough with or without productive sputum, and new pulmonary infiltrates must be considered to have an infectious pneumonia, although acute lupus pneumonitis and diffuse alveolar hemorrhage may have similar presentation. Infectious pneumonia represents one of the most common causes of mortality in SLE. Bronchoalveolar lavage is often helpful in excluding an infectious pneumonia in the immunocompromised SLE patient[5]

Mycobacterial and Nocardial infection seem particularly important

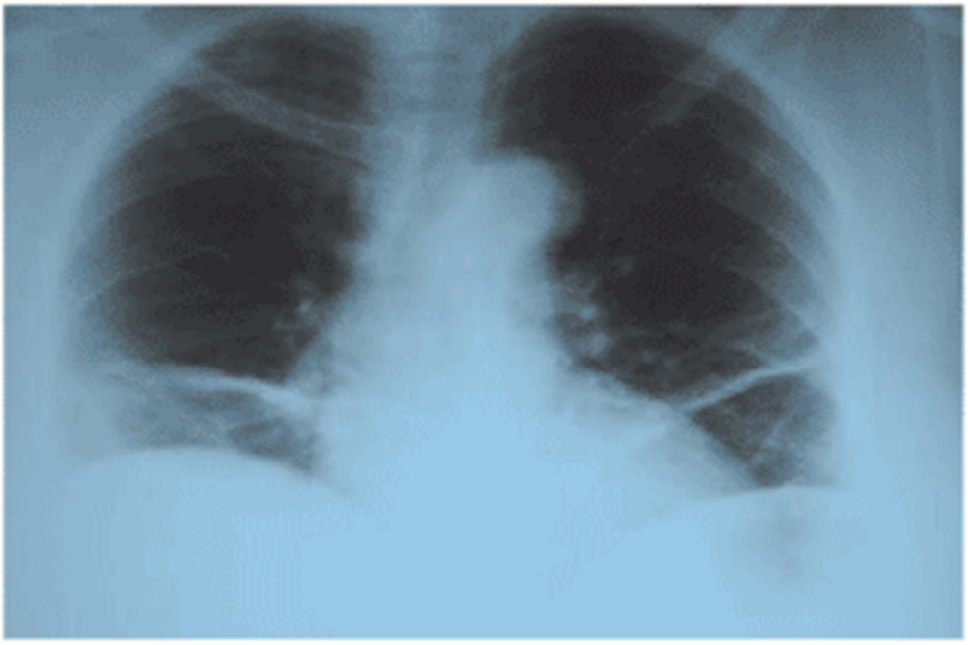
Shrinking lung syndrome:

It is estimated that weakness of the diaphragm and other respiratory muscles is found in one fourth of SLE patients. This accounts for previously unexplained findings of dyspnea without any markers of interstitial lung disease or pulmonary vascular disease. These patients will have bibasilar atelectasis, an elevated diaphragm on chest x ray, and restrictive physiology. This has been called as shrinking lungs syndrome

Although there is a reduction in a static lung volume, the diffusing capacity, when corrected for alveolar volume, remains normal, thereby distinguishing respiratory muscle dysfunction from interstitial lung disease. The likely explanation for this is a reduction in the Trans diaphragmatic pressure generated during maximal inspiration, which in turn reduces static lung compliance, producing the linear atelectasis seen on chest x ray. Moreover, in patients with respiratory muscle weakness no evidence for a generalized neuromuscular disease can be found. The pathogenesis of respiratory muscle dysfunction remains unexplained, although phrenic nerve conduction abnormalities have been excluded.

Corticosteroids are not frequently effective treatment modality. CPAP or BiPAP, particularly at night, may improve these patients' daytime

symptoms, although there is limited evidence available to support noninvasive nocturnal ventilation



Acute Reversible Hypoxemia Syndrome [28]

It occurs in acutely ill SLE patients who are experiencing systemic exacerbation have been noticed. These patients have hypoxia and a increased A-a O2 gradient, but both the chest x ray and ventilation-perfusion lung scans are normal.it is postulated that there is complement-activated neutrophil aggregation in the pulmonary vasculature. The hypoxemia improves with immunosuppressive therapy

Given the high incidence of antiphospholipid syndrome it is better to exclude thromboembolic manifestation before considering diagnosis of acute reversible hypoxia syndrome

Investigation

Tests for autoantibodies:

ANA: Usually positive in 95% of patients

Anti-dsDNA: increase in quantities of anti-dsDNA, indicates a severe manifestation of nephritis or Vasculitis especially if it is associated with decreasing level of C3 or C4 complements[4]

APL: APL identities patient at increased risk for venous clotting or arterial clotting, low platelet count and fetal loss[4]

Anti-Ro: it indicates increased risk for neonatal lupus syndrome, neonatal heart blocks sicca syndrome and sub-acute cutaneous lupus erythematosus

Thus women of reproductive age group should be looked for anti-phospholipid antibody and anti-Ro.

Other standard tests for diagnosis:

- Complete blood count
- Platelet count

- Urine analysis

These will help in detecting abnormalities that contribute to the diagnosis and influence management decisions.

Tests for following disease course:

- Anti-DNA antibodies level
- Several components of complement
- Activated complement products
- Soluble IL-2 levels
- IFN-inducible gene expression in peripheral blood cells
- Neutrophil gelatinase associated lipocalin
- Monocyte chemotactic protein-1
- Urinary level of TNF-like weak inducer

Treatment:

SLE cannot be cured completely and sustained remissions are rare. Treatment given either in the basis of

1. Conservative therapies for management non-life threatening SLE

2. Management of life-threatening SLE
3. Special conditions in SLE that may require additional or different therapies
4. Preventive therapies
5. Experimental therapies

Medications for management of SLE:

NSAIDs and salicylates

Dose range: higher dose usually required

Drug interactions: Angiotensin II receptor blockers, ACEI, Steroids, antifungal (AZOLES), Methotrexate, Thiazides,

Adverse drug reactions: Increased chance of aseptic meningitis, Decreased renal function, Vasculitis of skin

COX-2 specific inhibitors may aggravates coronary artery disease

Aspirin can cause hearing damage and tinnitus

NSAIDS and aspirin can cause gastrointestinal events and symptoms, allergic manifestations, dermatitis, giddiness, acute kidney injury, edema and SHT

Glucocorticoids for topical application

Dose: mild dose for face, mild –high dose for other sites

Drug interactions: no interaction

Adverse drug reactions:

Skin thinning, dermatitis of applied area, folliculitis, decreased pigmentation, skin infection

Topical sunscreen

Dose: SPF 15 at least (30+ advised)

Drug interaction; no drug interaction

Adverse drug reactions:

Dermatitis on applied site

Hydroxychloroquine

Dose: 200-400 mg qd

Drug interactions: none

Adverse drug reactions: Retinal damage, agranulocytosis, aplastic anemia, ataxia, cardiomyopathy, Dizziness, Myopathy, Ototoxicity, Peripheral neuropathy, Pigmentation of skin, Seizures, Thrombocytopenia

Dehydroepiandrosterone (DHEA)

Dose: 200 mg qd

Drug interactions: unclear

Adverse drug reactions: acne, menstrual irregularities, increased levels of androsterone

Methotrexate

Usually used for skin manifestation and joint manifestation

Dose: 10-25 mg once a week with folic acid, reduce dose in renal patients according to GFR

Drug interactions: Retinoid, Leflunomide, aspirin, Beta lactams, Sulphonamides, Trimethoprim,

Adverse drug reactions: reduced hemoglobin, BM suppression, Leukopenia, low platelet count, liver and renal effects, Infections, CNS toxicity, pulmonary effects, Pneumonitis, Severe skin manifestation, fits

Teratogenicity – pregnancy category X

Glucocorticoids and methylprednisolone

Dose: Prednisolone: 50mg/d for 50 kg individual for SLE flare, 5to 15mg/d for milder disease

Methylprednisolone: 1 g IV qd for 3 days for severe disease

Drug interactions: Angiotensin II receptor blockers, ACE inhibitors, Antiarrhythmic, pain killers, Non-steroidal anti-inflammatory other immunosuppressant Phenytoin, diuretic (acting on DCT), OHA, coumarins derivatives

Adverse drug reactions: Infections, Zoster infection, Hypertension, High sugar, low serum potassium, Acne, Allergic manifestation, Anxiety, ischemic necrosis of bone, Cushingoid feature, Congestive heart failure, thin skin, decreased sleep, Menstrual , irregularity, Mood variability, reduced bone density, Psychiatric manifestations

Cyclophosphamide

Dose: 7-25 mg/kg/month for 6 months, followed by maintenance with daily oral mycophenolate or azathioprine

Drug interactions: With drug used to treat hyperuricemia, BM suppressants, G-CSF, Hydroxydaunorubicin, Anti CD20, SCH,

Adverse drug reactions: Zoster infection, BM suppression, painless hematuria, CA bladder, decreased hair, vomiting, loose stools, Myalgia, Neoplasia,

Ovarian dysfunction and testicular dysfunction

Can be reduced by treatment with gonadotropin releasing hormone agonist (Lupron 3.75 mg IM) prior to monthly cyclophosphamide dose

Teratogenicity – pregnancy category D

Mycophenolate mofetil

Dose: 2-3 g/d

Drug interactions: antiviral, Pro-drug for mercaptourine, cholestyramine, ferrous salts, OCP

Adverse drug reactions: Infection, Bone marrow suppression, Lymphoproliferative disorder, neoplasia, hair loss, loose stools, pyrexia, Headache, High blood pressure, dyslipidemia, low serum potassium, decreased sleep, bilateral leg swelling, involuntary movements of peripheral joints, macular Rash

Azathioprine:

Dose: 100to 150mg/d, reduction of dose if increased renal parameter

Drug interactions: Many drugs should be careful

Adverse drug reactions: infection, zoster infection, BM suppression, liver toxicity, neoplasia, hair loss, pyrexia, flu like manifestation gastrointestinal symptoms, teratogenicity – pregnancy category D

Belimumab:

Dose: 10 mg/kg IV

Drug interactions: IVIg

Adverse drug reactions: infusion reactions, infections

Rituximab:

Dose: 375 mg/m^2 once a week for 4 weeks

Drug interactions: IVIg

Adverse drug reactions: PML infection, infusion reaction, headache, arrhythmias, allergic responses, teratogenicity – pregnancy category C

Preventive therapies: [4]

- Appropriate vaccination: administration of influenza vaccine and pneumococcal vaccine
- preventing frequent UTIs
- Steps to be taken to prevent osteoporosis

- Treatment of hypertension and appropriate steps to prevent development of atherosclerosis including control of dyslipidemia, treatment of hyperglycemia, management of obesity

Experimental therapies:[4]

- Activated B lymphocytes with anti-BLyS or TACI-Ig
- Inhibition of IFN-α
- Inhibition of B/T cell second signal co-activation with CTLA-Ig
- Inhibition of innate immunity activation via TLR7 or TLR9 and induction of regulatory T cells with peptides from immunoglobulin's or auto antigens

MATERIAL AND METHODS

Rheumatology Ward, Outpatient of Medical and Rheumatology O.P. of Rajiv Gandhi Government General Hospital during period from May 2012 to October Systemic Lupus Erythematosus patient admitted in Medical Ward, 2012, were selected for this study.

INCLUSION CRITERIA

Patient known case of SLE fulfilling ACR Criteria with disease duration more than 5 years were taken into the study.

EXCLUSION CRITERIA

- Childhood Lupus
- Pregnancy
- Overlap Syndrome
- Mixed Connective Tissue Disorder
- ILD due to occupational lung Disease and other Non-lupus causes.

Detailed history was taken from patient according to questionnaire and subjected to thorough clinical examination and Investigations. And even history regarding presence or absence of Lupus Nephritis was taken.

SAMPLE SIZE:

50 Patients

STUDY DESIGN:

Cross sectional study

STUDY POPULATION

SLE patient attending medicine and rheumatology op and admitted in medical and rheumatology ward

STUDY CENTRE

Madras Medical College and Rajiv Gandhi Government General Hospital, Chennai

METHODOLOGY

Patients with SLE more than 5 years disease duration were taken into the study. Both symptomatic and asymptomatic have been taken into study

Respiratory symptoms:

Cough with or without expectoration

Dyspnea

Hemoptysis

Pleurisy

Patient were subjected to thorough history and physical examination

Patients were subjected to the following investigation

Chest X-ray,

HRCT Chest,

Pulmonary function tests,

Complete haemogram,

Renal and liver function tests,

Sputum analysis,

Urine analysis

Immunological investigations on need for basis are done such as

CRP

ANA

RF

Anti-ds-DNA

ACL (IgM) and (IgG)

Cardiac evaluation is done by ECG and Echocardiography, Lupus Nephritis patient renal biopsy proven with Respiratory symptoms is also included.

And various finding like with pleuritis with or without pleural effusion, alveolitis, interstitial fibrosis, lupus pneumonitis, shrinking lung syndrome, Intra – alveolar Hemorrhage, pulmonary thromboembolism

And pulmonary arterial Hypertension, secondary effects are atelectasis, due to diaphragmatic weakness, pneumonia, drug side effects and pleura-pulmonary consequences of cardiac failure and renal failure.

Ethical Committee Clearance:

Obtained

Informed Consent

Obtained from all patient included in study

Statistical Analysis

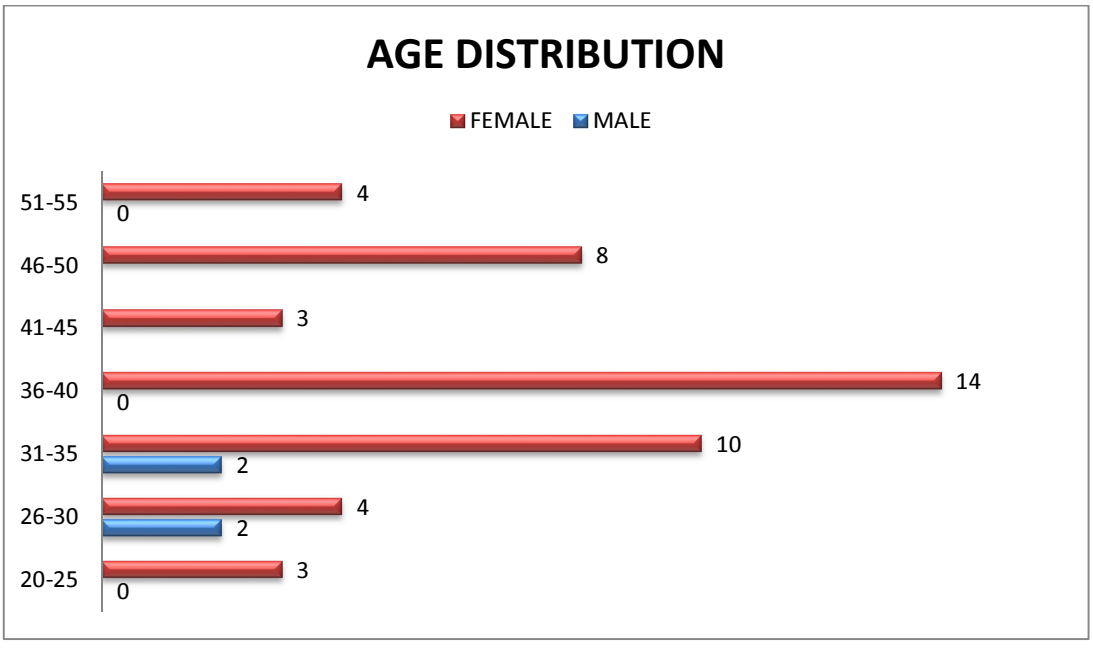
Statistical analysis done using SPSS software

Conflict Of Interest None

OBSERVATION AND RESULTS

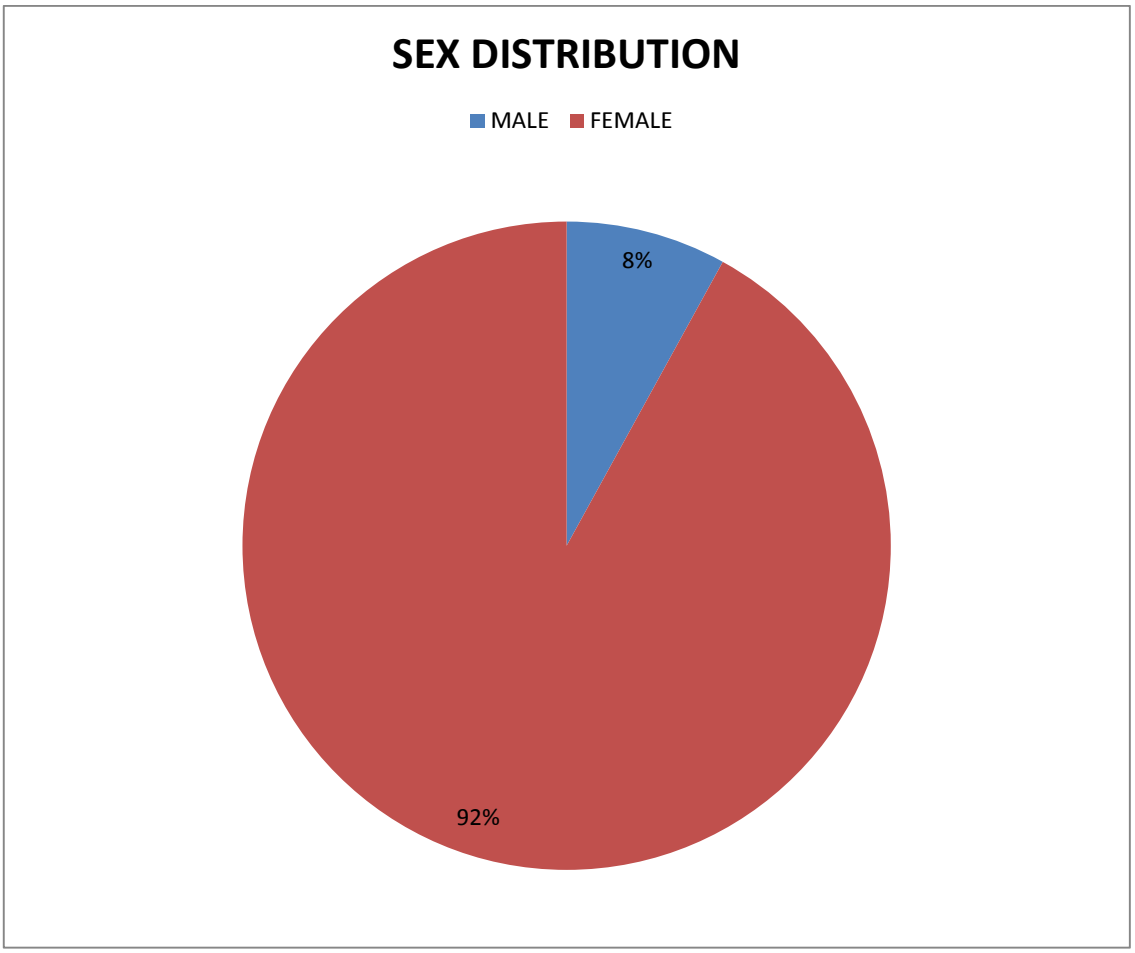
AGE DISTRIBUTION

AGE(in years)	MALE	FEMALE	TOTAL	PERCENTAGE
20 to 25		3	3	6
26 to 30	2	4	6	12
31 to 35	2	10	12	24
36 to 40		14	14	28
41 to 45		3	3	6
46 to 50		8	8	16
51 to 55		4	4	8



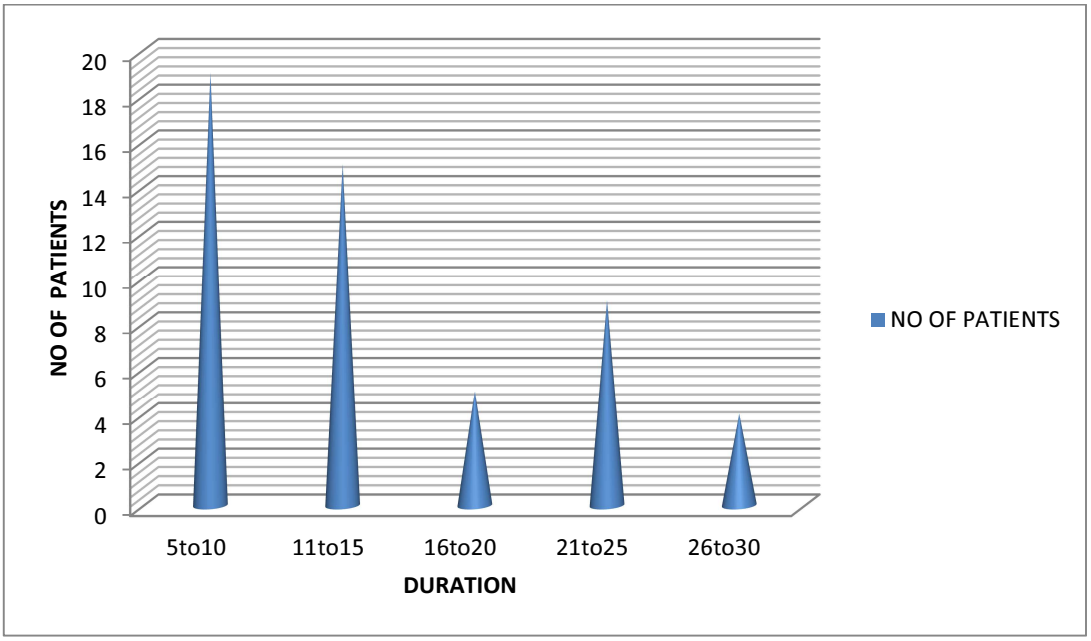
SEX DISTRIBUTION

SEX	NO.OF PATIENTS	PERCENTAGE
MALE	4	8
FEMALE	46	92



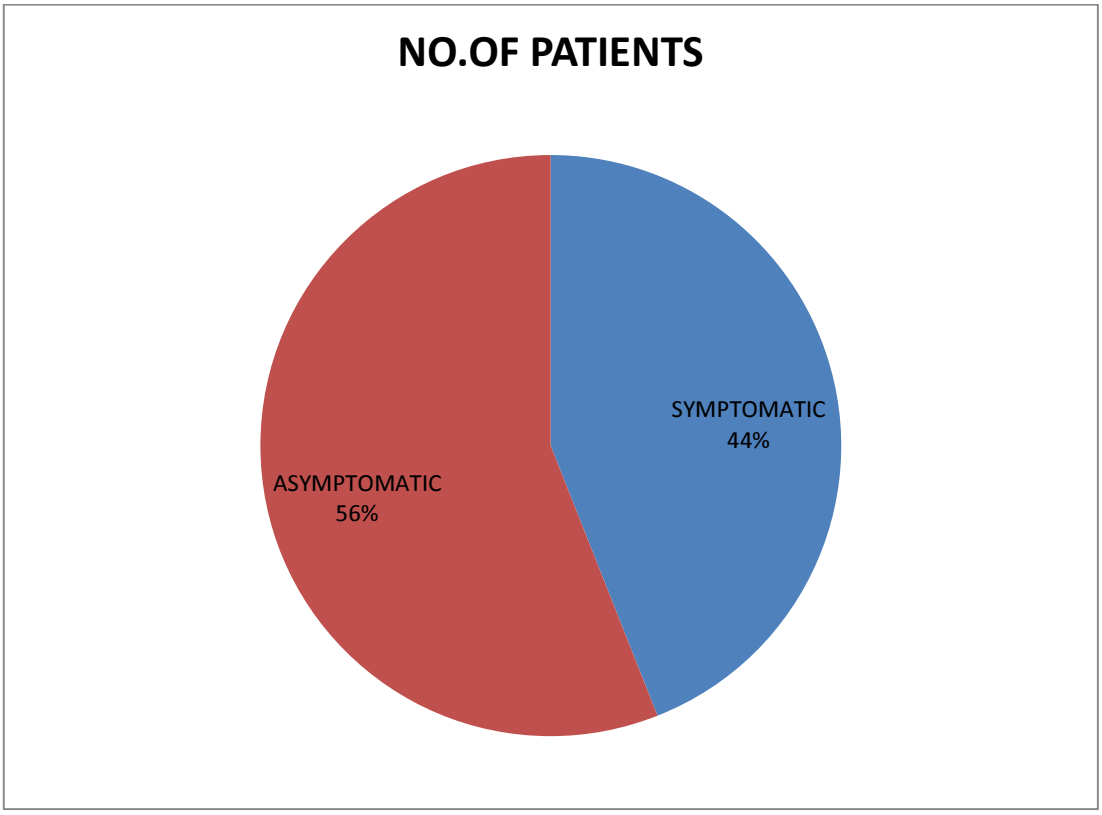
DURATION DISTRIBUTION

DURATION(in years)	NO.OF PATIENTS	PERCENTAGE
5-10	19	38
11-15	15	30
16-20	5	10
21-25	9	18
26-30	2	4



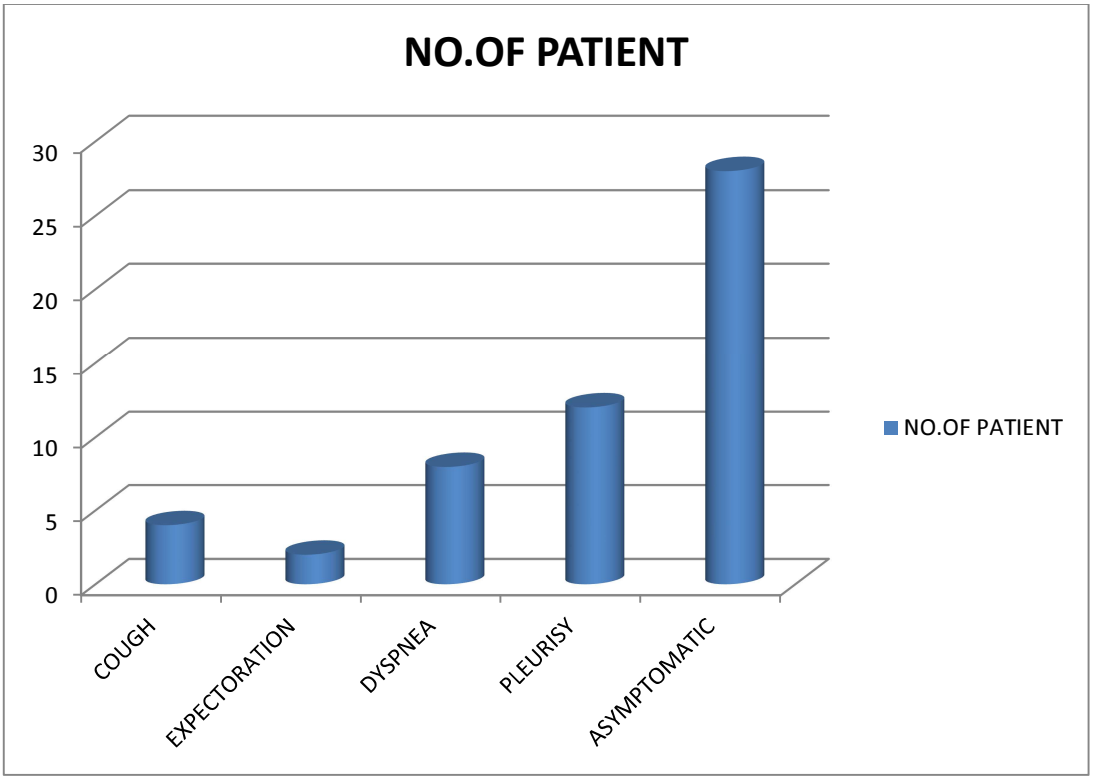
SYMPTOMATIC AND ASYMPTOMATIC DISTRIBUTION

MANIFESTATION	NO. OF PATIENTS	PERCENTAGE
SYMPTOMATIC	22	44
ASYMPTOMATIC	28	56



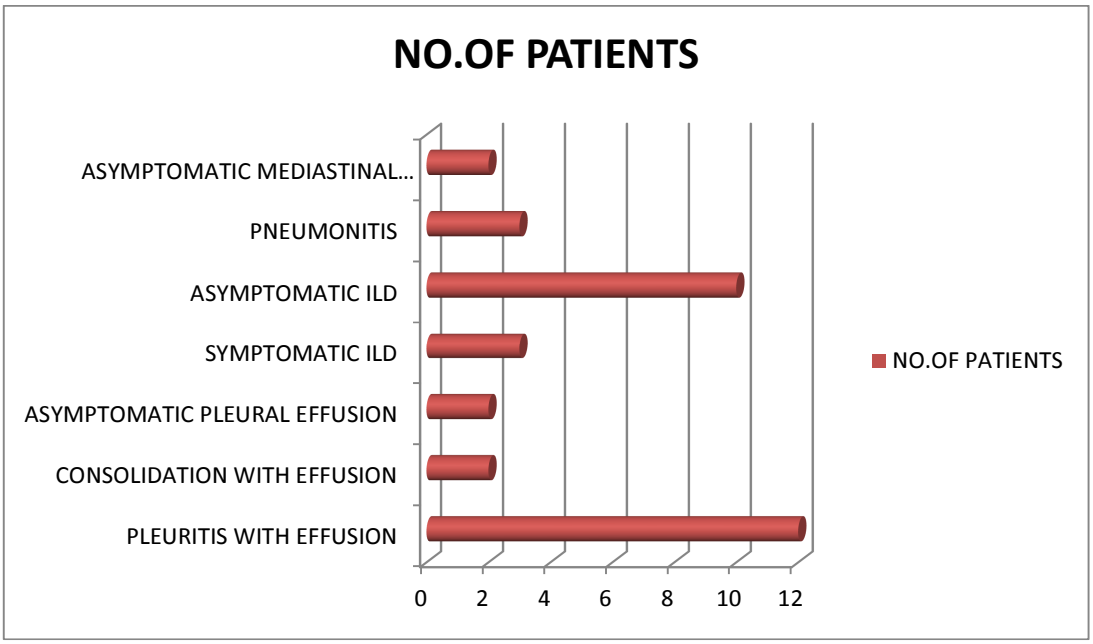
SYMPTOMS DISTRIBUTION

SYMPTOMS	NO.OF PATIENTS	PERCENTAGE
COUGH	4	8
COUGH WITH EXPECTORATION	2	4
DYSPNEA	8	16
PLEURISY	12	24
ASYMPTOMATIC	28	56



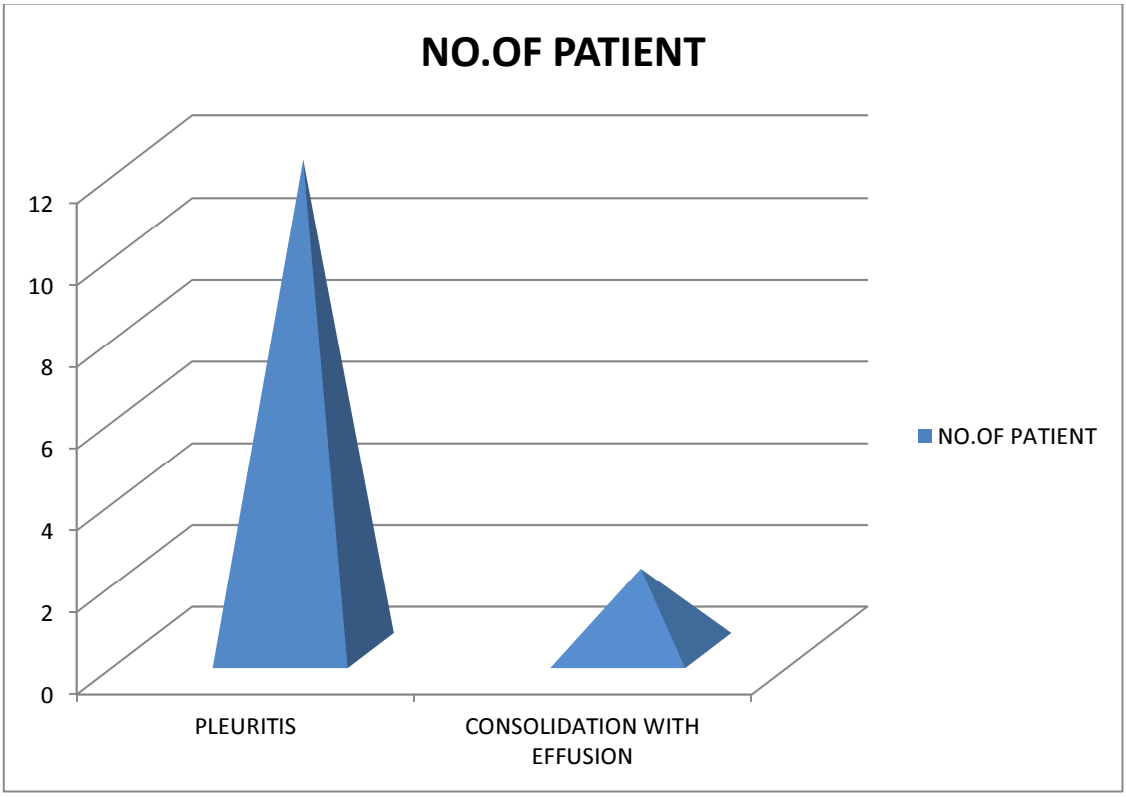
DISEASE DISRIBUTION

DISEASES	NO.0F PATIENTS	PERCENTAGE
PLEURITIS WITH EFFUSION	12	24
CONSOLIDATION WITH EFFUSION	2	4
ASYMPTOMATIC PLEURAL EFFUSION	2	4
SYMPTOMATIC ILD	3	6
ASYMPTOMATIC ILD	10	20
PNEUMONITIS	3	6
ASYMPTOMATIC MEDIASTINAL LYMPHADENOPATHY	2	4



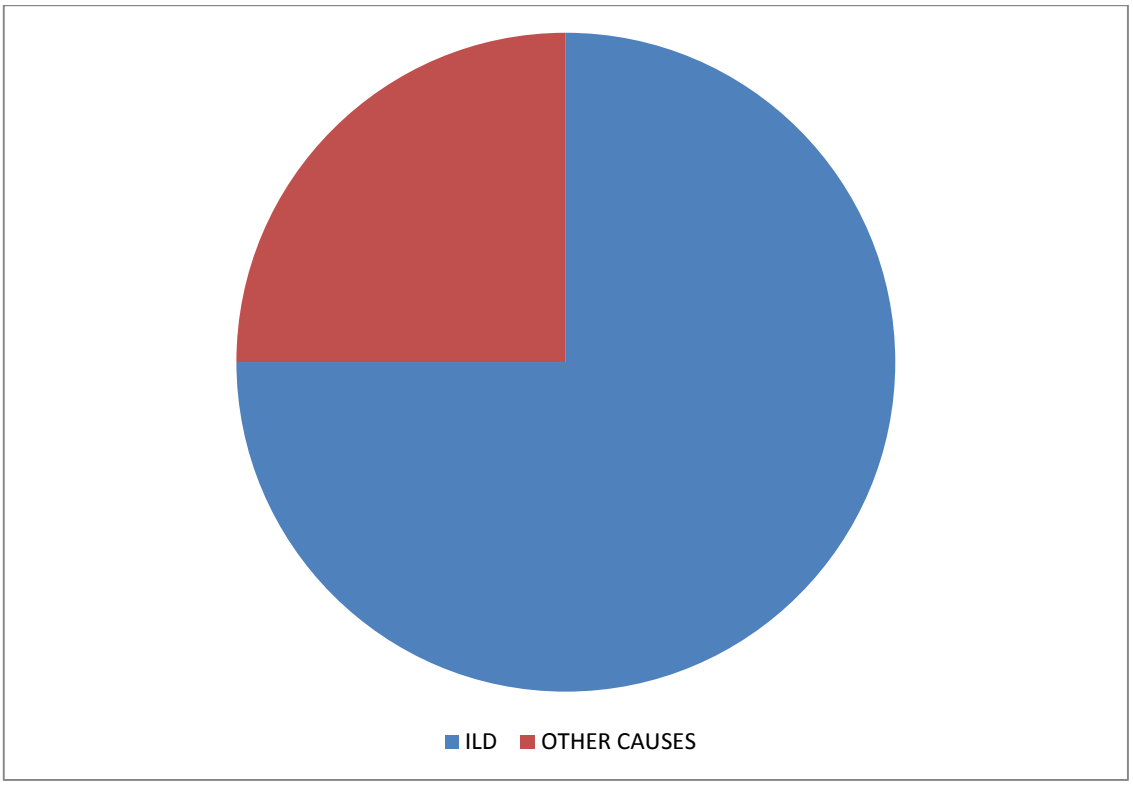
PLEURISY DISTRIBUTION

PLEURISY	NO.OF PATIENTS	PERCENTAGE
PLEURITIS	12	24
CONSOLIDATION WITH EFFUSION	2	4



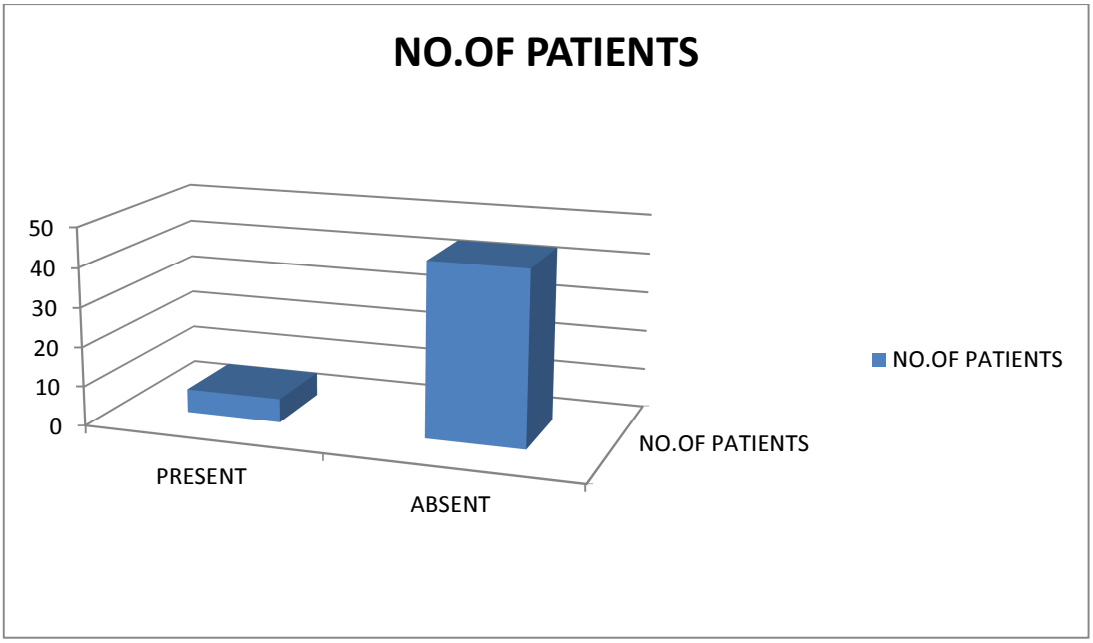
DYSPNEA DISTRIBUTION

DYSPNEA	NO. OF PATIENTS	PERCENTAGE
ILD	6	12
OTHER CAUSES	2	4



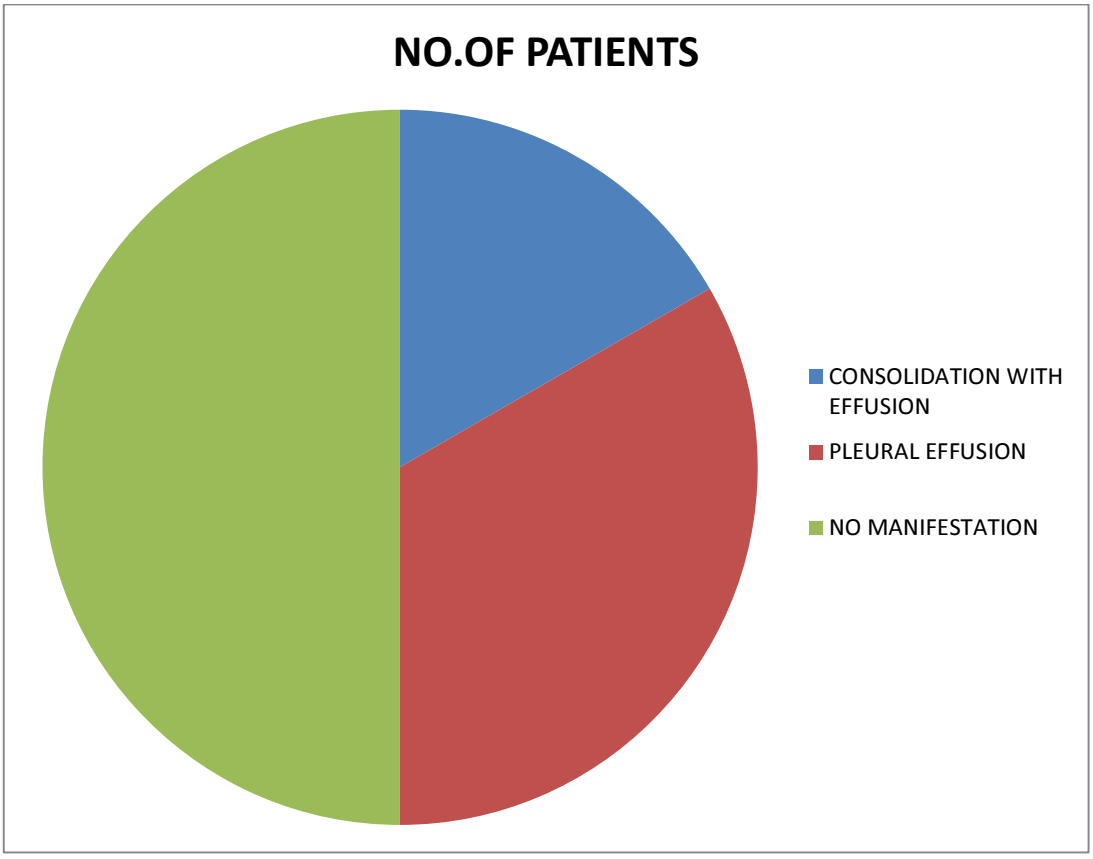
LUPUS NEPHRITIS DISTRIBUTION

LUPUS NEPHRITIS	NO.OF PATIENT	PERCENTAGE
PRESENT	6	12
ABSENT	44	88



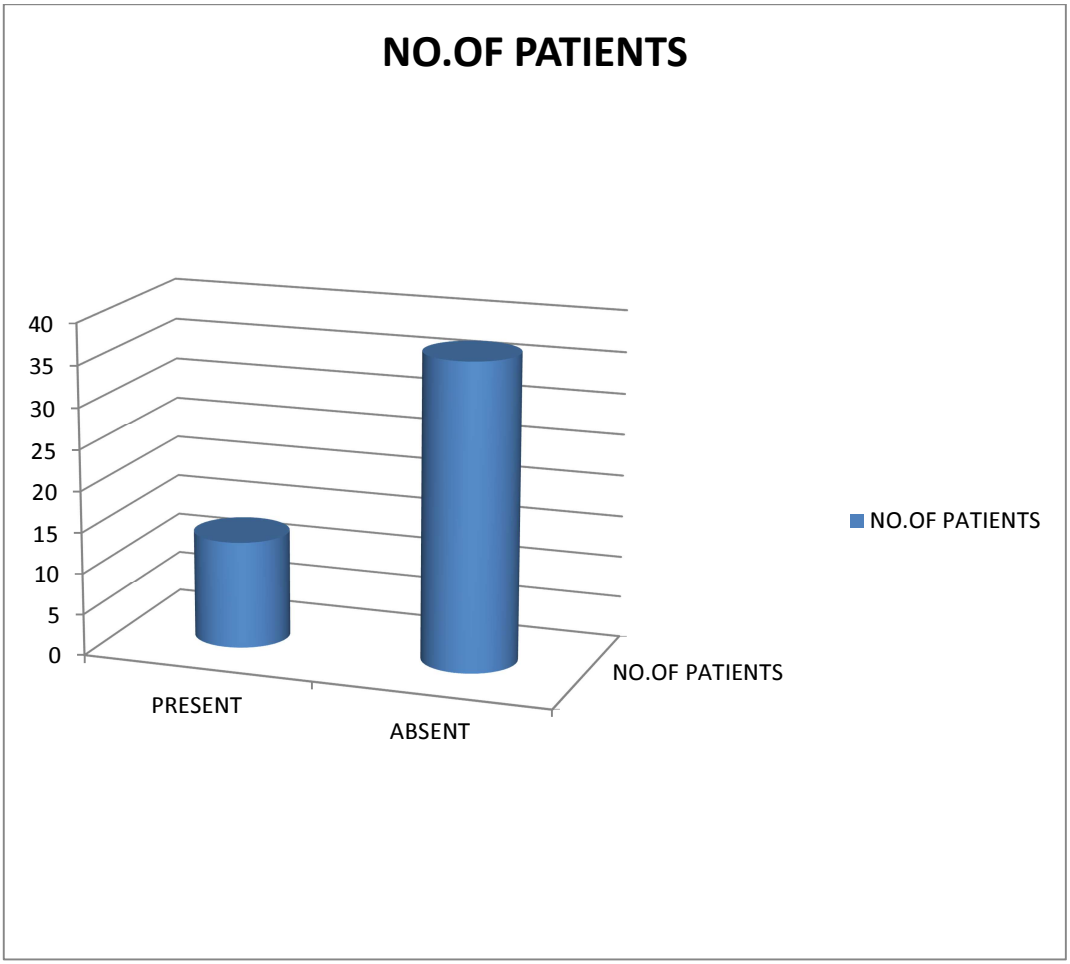
LUPUS NEPHRITIS AND PULMONARY MANIFESTATION

LUPUS NEPHRITIS	NO.OF PATIENTS	PERCENTAGE
CONSOLIDATION WITH EFFUSION	1	16.6
PLEURAL EFFUSION	2	33.3
NO MANIFESTATION	3	50



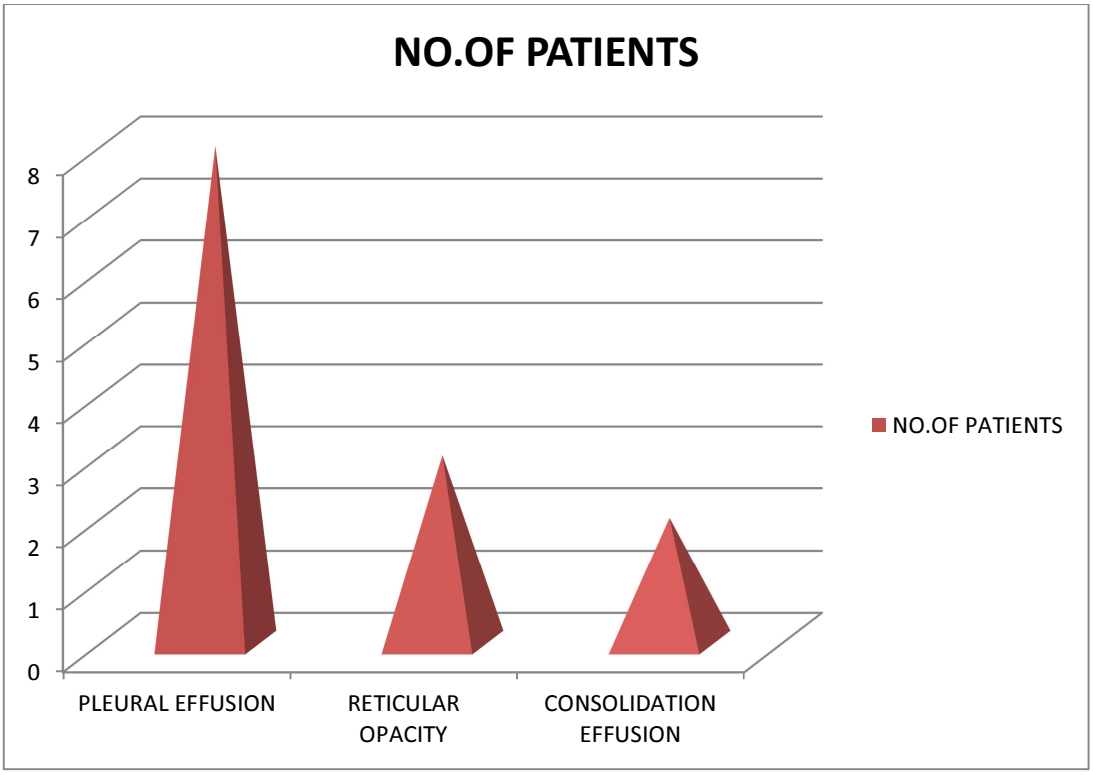
X RAY AND NO OF POSITIVE CASES

X RAY FINDING	NO.OF PATIENTS	PERCENTAGE
PRESENT	13	26
ABSENT	37	74



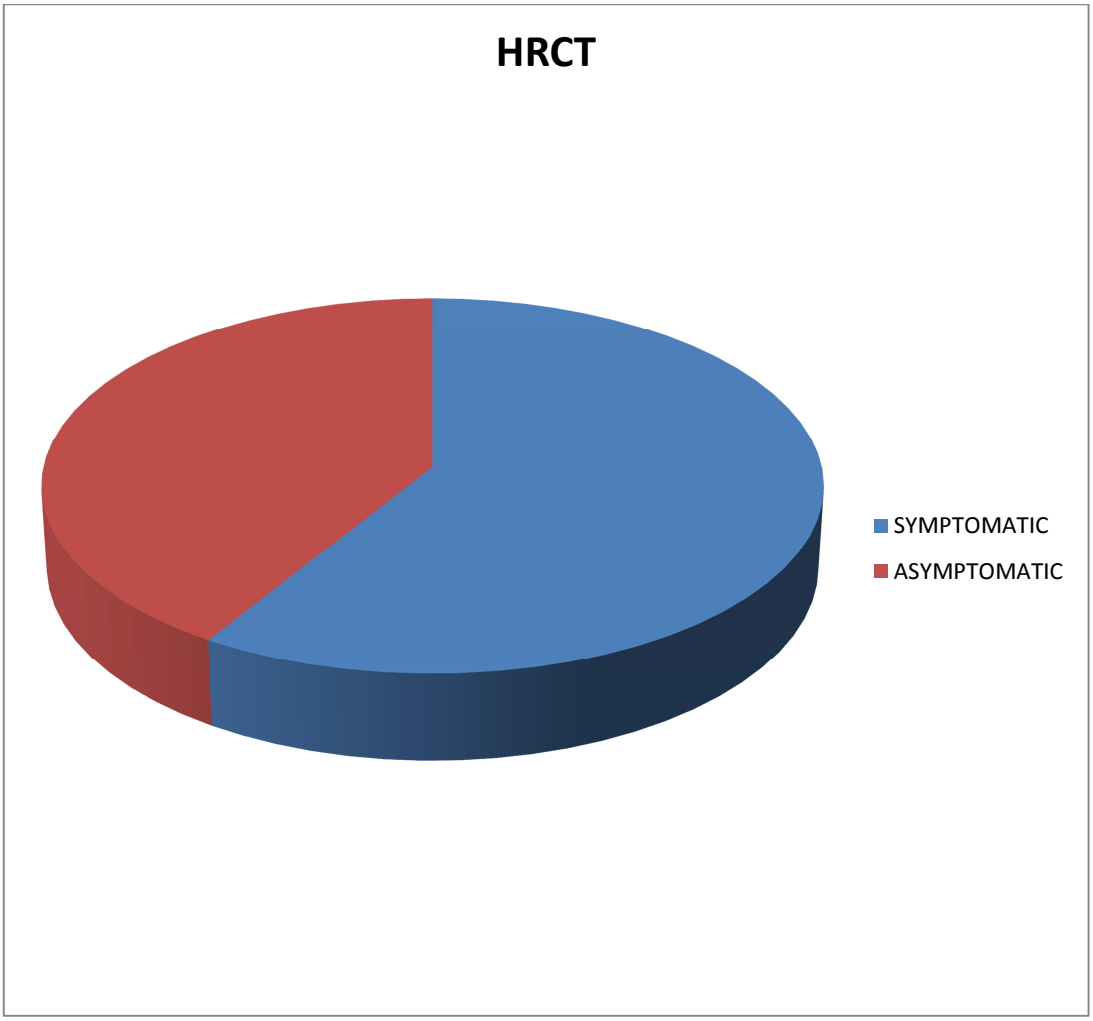
X RAY AND ITS FINDINGS

X RAY FINDINGS	NO.OF PATIENTS	PERCENTAGE
PLEURAL EFFUSION	8	61.54
RETICULAR OPACITY	3	23.07
CONSOLDATION WITH EFFUSION	2	15.38



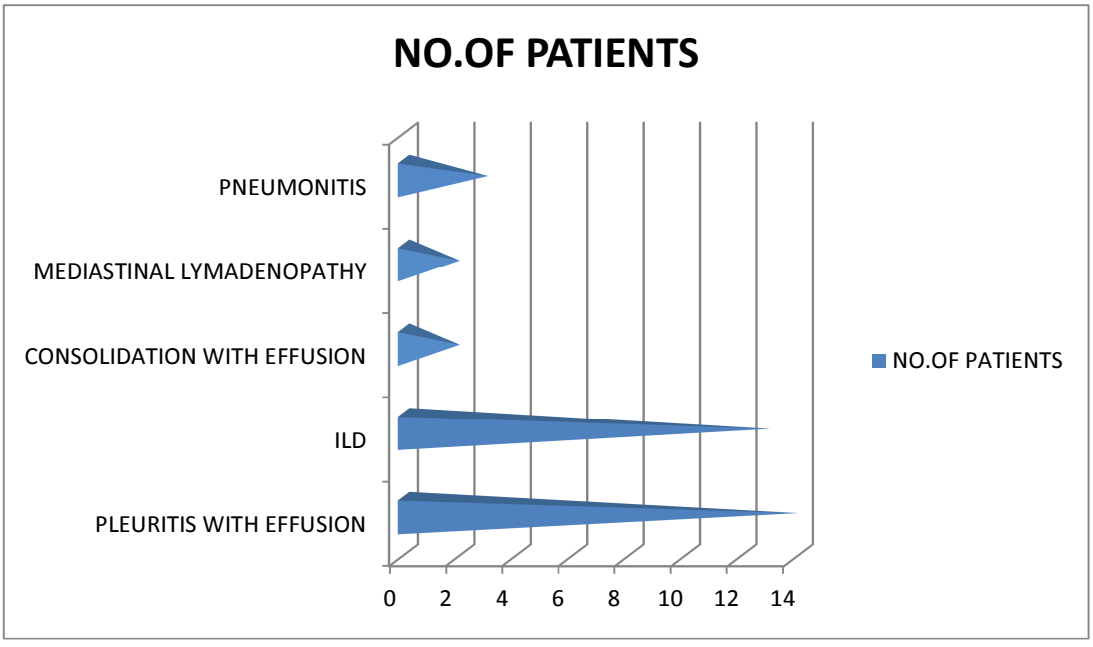
HRCT DISTRIBUTION AMONG SYMPTOMATIC AND ASYMPTOMATIC

MANIFESTATION	HRCT	PERCENTAGE
SYMPTOMATIC	20	40
ASYMPTOMATIC	14	28



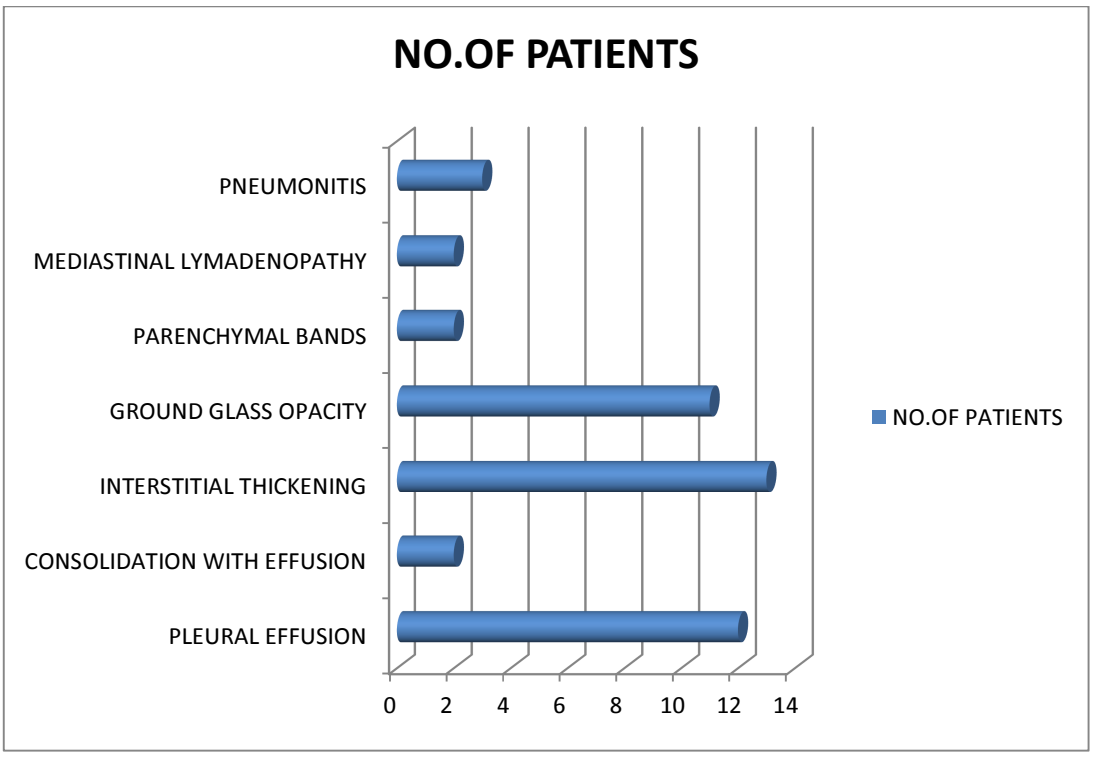
HRCT AND VARIOUS MANIFESTATIONS

HRCT	NO.OF PATIENTS	PERCENTAGE
PLEURITIS WITH EFFUSION	14	41.17
ILD	13	38.23
CONSOLIDATION WITH EFFUSION	2	5.88
MEDIASTINAL LYMPHADENOPATHY	2	5.88
PNEUMONITIS	3	8.82



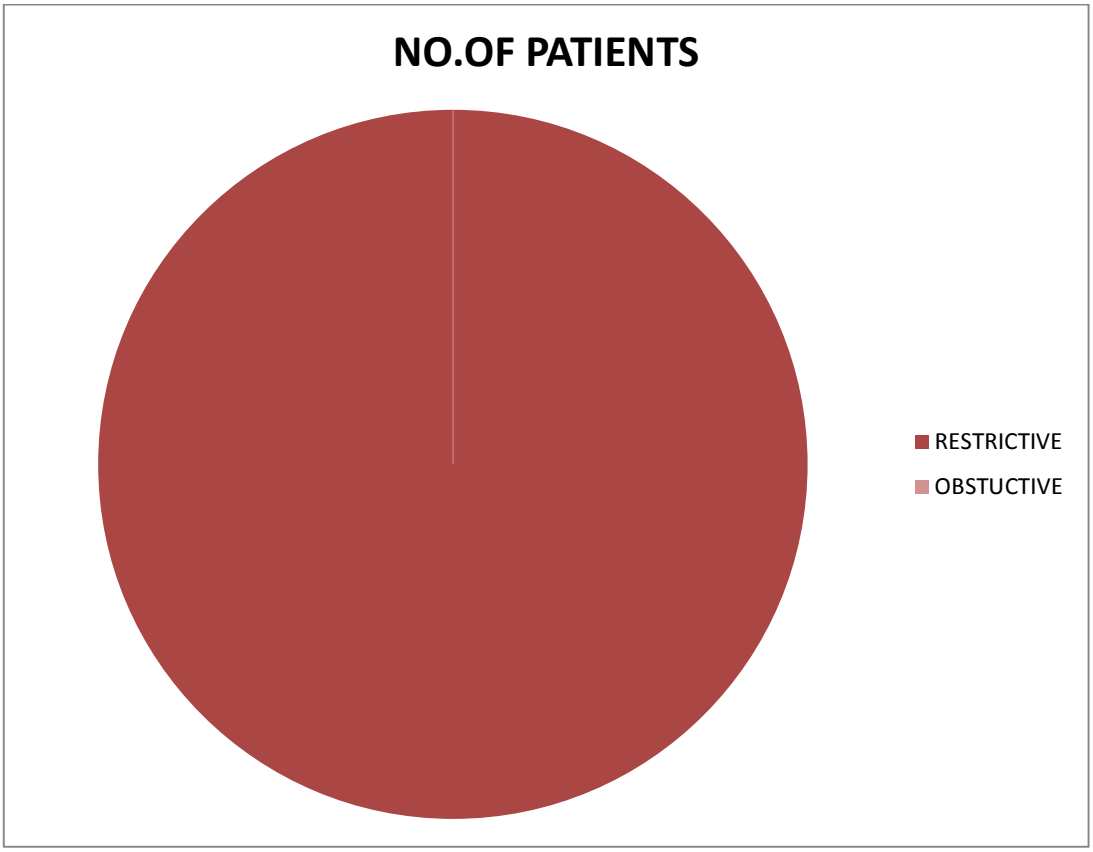
HRCT AND ITS FINDINGS

HRCT FINDING	NO.OF PATIENTS	PERCENTAGE
PLEURAL EFFUSION	14	41.17
CONSOLIDATION WITH EFFUSION	2	5.88
INTERSTITIAL THICKENING	13	38.23
GROUND GLASS OPACITY	11	32.35
PARENCHYMAL BANDS	2	5.88
MEDIASTINAL LYMADENOPATHY	2	5.88



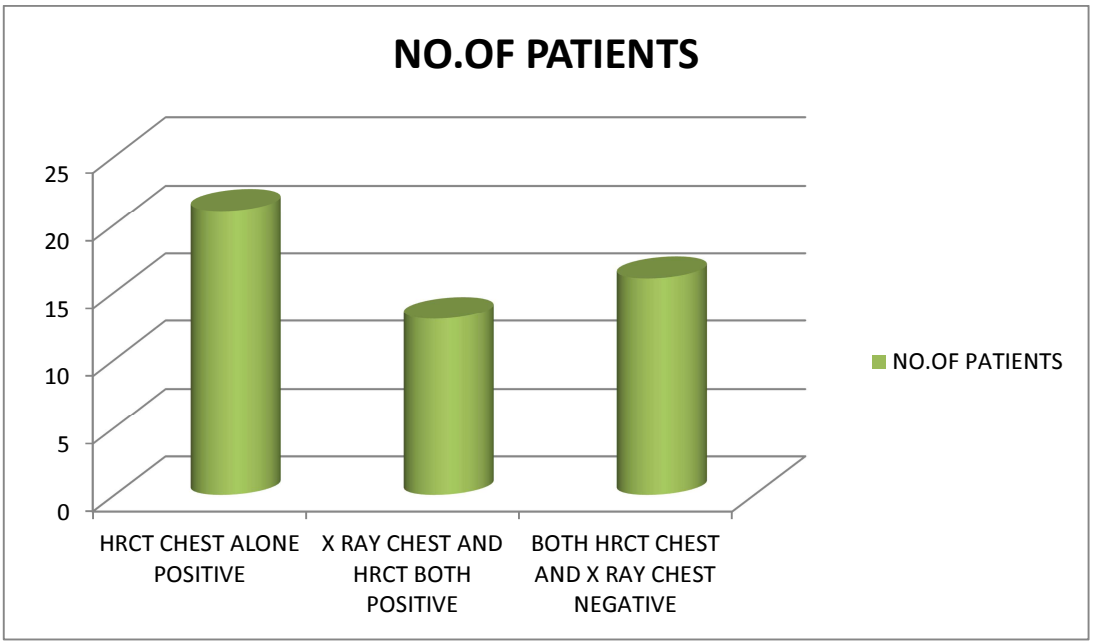
PULMONARY FUNCTION TEST

PFT FINDINGS	NO.OF PATIENTS	PERCENTAGE
RESTRICTIVE PATTERN	7	14
OBSTRUCTIVE PATTERN	0	0



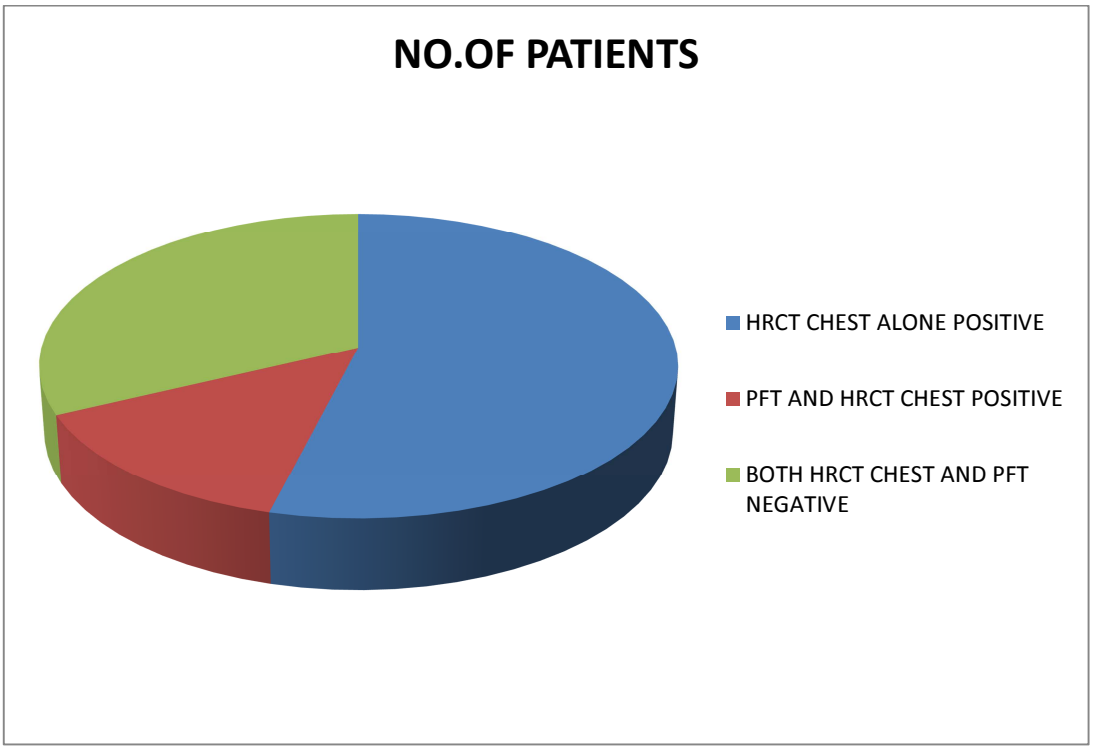
HRCT AND X RAY COMPARISON

IMAGE	NO.OF PATIENTS	PERCENTAGE
HRCT CHEST ALONE POSITIVE	21	42
X RAY CHEST AND HRCT CHEST POSITIVE	13	26
BOTH HRCT CHEST AND X RAY CHEST NEGATIVE	16	32



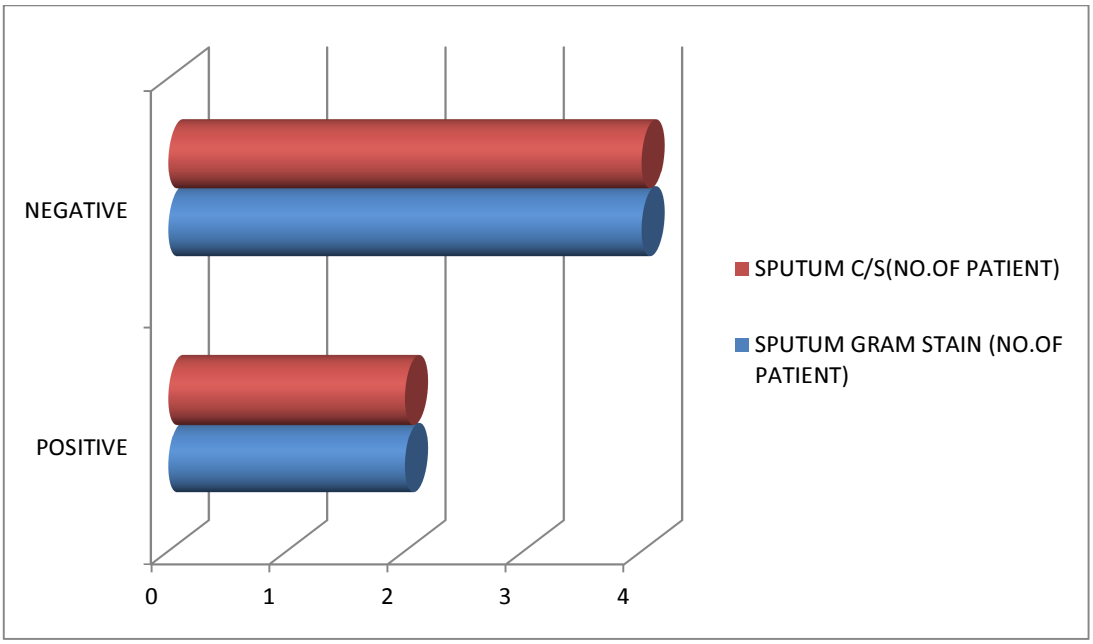
HRCT AND PFT COMPARISON

INVESTIGATION	NO.OF PATIENTS	PERCENTAGE
HRCT CHEST ALONE POSITIVE	27	54
HRCT CHEST AND PFT POSITIVE	7	14
HRCT CHEST AND PFT NEGATIVE	16	32



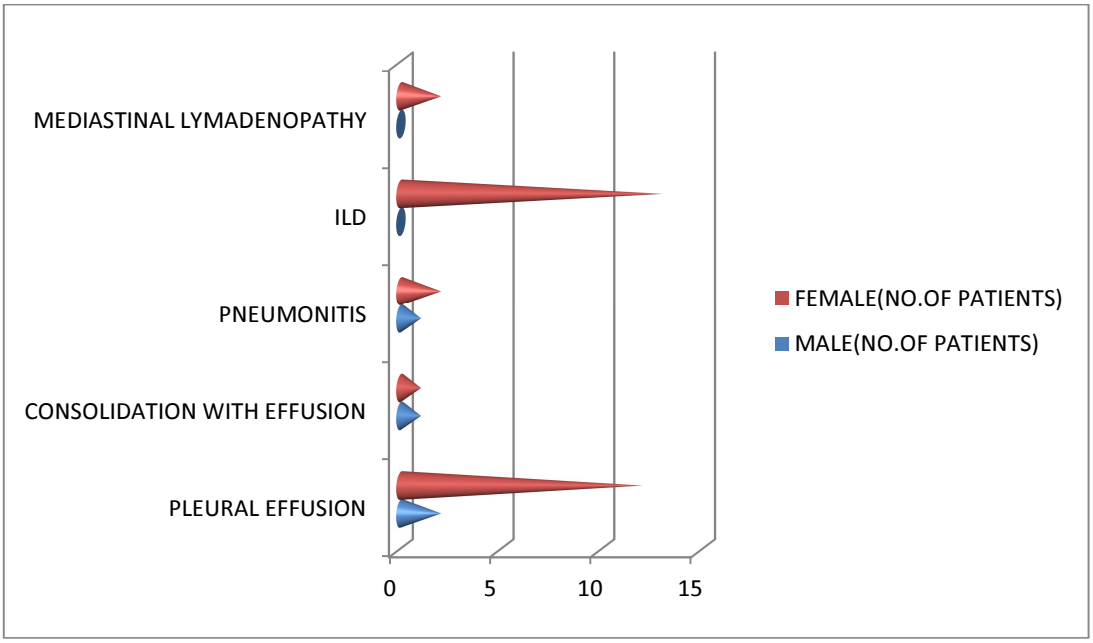
SPUTUM RESULT DISTRIBUTION

RESULT	SPUTUM GRAM STAIN	SPUTUM C/S	PERCENTAGE
POSITIVE	2	2	4
NEGATIVE	4	4	8



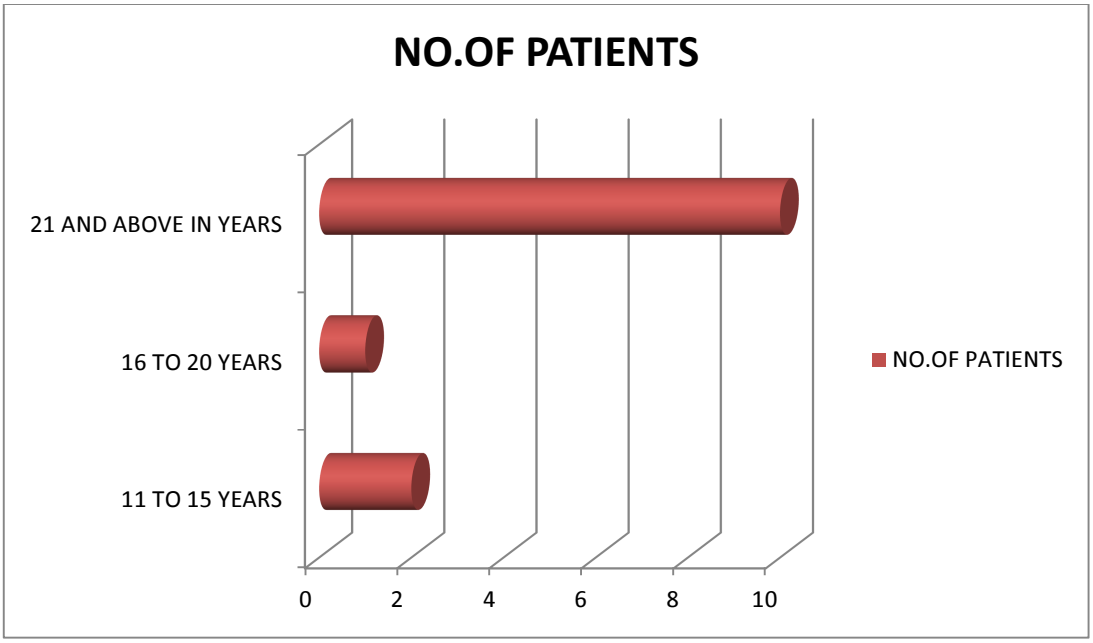
DISEASE DISTRIBUTION ACCORDING TO SEX

DISEASES	MALE	FEMALE	TOTAL
PLEURAL EFFUSION	2	12	14
CONSOLIDATION WITH EFFUSION	1	1	2
PNEUMONITIS	1	2	3
ILD	0	13	13
MEDIASTINAL LYMADENOPATHY	0	2	2



ILD DISTRIBUTION IN RELATION TO DURATION

DURATION IN YEARS	NO.OF PATIENTS	PERCENTAGE
11-15	2	4
16-20	1	2
21 AND ABOVE	10	20



RESULTS

In the present study 50 SLE patients were taken into study group

Age distribution

The present study observed that 70 per cent of patients of SLE were in 3rd and 4th decade of life, 22 per cent of patients were in 5th decade of life and above

Sex distribution

In our study sex distribution were 92 per cent of female and 8 per cent of male

Duration distribution

The duration distribution of the present study were as follows 38 per cent of patients were between 5 to 10 years of duration, 30 per cent of patients were between 11 to 15 years of duration, 10 per cent of patient were between 16 to 20 years of duration, 18 per cent of patients were between 21 to 25 years of duration, and 4 per cent of patients were between 26 to 30 years of duration.

Symptomatic Vs. Asymptomatic

In our study among 50 patients, symptomatic were 22 patients (44%), and asymptomatic were 28 patients (56%)

Symptoms distribution

In the present study cough was present in 8 per cent of patients, cough with expectoration was present in 4 per cent of patient, dyspnea was present in 16 per cent of patients, pleurisy was present in 24 per cent of patients, and 32 per cent of patients were asymptomatic.

Disease distribution

In our study various pulmonary manifestation were distributed as follows, pleuritis with effusion were present in 12 patients(24%), consolidation with effusion were present in 2 patients(4%), asymptomatic pleural effusion were present in 2 patients(4%), symptomatic interstitial lung disease was seen in 3 patients(6%), asymptomatic interstitial lung disease was seen in 10 patients(20%), pneumonitis were present in 3 patients(6%), and asymptomatic mediastinal lymphadenopathy in 2patients(4%).

Pleurisy distribution

In the present study pleurisy was present in 12 patients of pleuritis and 2 patients of consolidation with pleural effusion.

Dyspnea distribution

In our study total patients presenting with dyspnea were 8 patients, due to interstitial lung disease 6 patients, and in 2 patients due to other causes like anemia, nephritis and others

Lupus nephritis distribution

In this study lupus nephritis was present in 6 patients (12%), and absent in 44 patients (88%).

Lupus nephritis and pulmonary manifestation

In the present study out of 6 patients who had lupus nephritis, pulmonary manifestations are consolidation with effusion in 1 patient (16.6%), pleural effusion in 2 patients (33.3%), and 3 patients (50%) were no pulmonary manifestation.

X ray distribution

In our study x ray findings were present in 26 per cent of patients (13), and normal x ray was seen in 74 per cent of patients (37).

X ray and its findings

In present study positive x ray findings were seen in 13 patients and various findings seen are as follows pleural effusion in 8 patients (61.54%),

reticular opacity in 3 patients (23.07%), and consolidation with effusion in 2 patients (15.38%).

HRCT chest distribution

In this study HRCT showed positive results in 20 patients who were symptomatic (40%), and among asymptomatic 14 patients had positive HRCT findings (28%), and rest of 16 patients who were asymptomatic showed normal HRCT.

HRCT chest and various pulmonary manifestations

In our study among 34 patients who had HRCT findings various pulmonary manifestation seen are as follows, pleuritis with pleural effusion was seen in 14 patients (41.17%), interstitial lung disease was present in 13 patients (38.23%), pneumonitis was seen in 3 patients (8.82%), consolidation with effusion in 2 patients (5.88), and mediastinal lymphadenopathy in 2 patients (5.88).

HRCT and its findings

In the present study various HRCT findings found are pleural effusion was present in 14 patients (41.17%), consolidation with effusion in 2 patients (5.88), interstitial thickening in 13 patients(38.23%), ground glass opacity in

11 patients (32.35%), parenchymal bands in 2 patients (5.88%), and mediastinal lymphadenopathy in 2 patients (5.88%).

Pulmonary function test results

In our study pulmonary function test was positive in 7 patients (14%), all of which were restrictive patterns and no case of obstructive pattern seen in pulmonary function test.

HRCT and x ray comparison

In this study HRCT alone were positive in 21 patients (42%), x ray chest and HRCT both positive in 13 patients (26%), and both HRCT and x ray chest negative in 16 patients (32%).

HRCT and pulmonary function test comparison

In this study HRCT alone positive in 27 patients (54%), both HRCT and PFT positive in 7 patients (14%), and both HRCT and PFT negative in 16 patients (32%).

Sputum result distribution

In the present study cough was present in 6 patients, sputum test done for these patient such as sputum gram stain was positive in 2 patients (33.3%), and negative in 4 patients (66.6%), and sputum culture was positive

in 2 patients and negative in 4 patients. Both sputum gram stain and culture positive were of same patients.

Disease distribution according to sex

In our study male patients with pulmonary manifestations are pleural effusions in 2 patients, pneumonitis in 1 patient, and consolidation with effusion in 1 patient. Among females pleural effusions was present in 12 patients, consolidation with effusion in 1 patient, pneumonitis in 2 patients interstitial lung disease in 13 patients and mediastinal lymphadenopathy in 2 patients.

Interstitial lung disease distribution in relation to duration

In the present study ILD in respect to duration are as follows, in 11 to 15 years of duration of disease 2 patients had ILD, between 16 to 20 years 1 patient had ILD, and duration of 21 years and above ILD present in 10 patients

DISCUSSION

The present study was conducted in 50 cases of SLE to study the various pattern of pulmonary involvement and to render help in the management of the problem detected out of them. All patients were subjected to routine clinical examination and specific investigations.

Age Distribution

In this series of 50 patients of SLE, the age of patient ranged from 20 to 55 years with maximum incidence in 3rd and 4th decade of life. In study conducted by S Kakati et al, total 40 patients of SLE were included, the age of the patients ranged from 12 to 60 years with maximum incidence between 16 to 25 years[1]. In study by H M Fenlon et al total numbers of SLE patients were 34 patients, patient's age group ranging from 15 to 68 years[2].

Sex Distribution

In our study total numbers of female patients were 46(92%), and male patients were 4 (8%). In study by S Kakati et al total numbers of female patients were 37(93.11%), and male patients were 3(7.89%)[1]. In study by H M Fenlon et al total numbers of female patients were 32(94%), 2 males (6%)[2].

Duration Distribution

In our study mean interval since the diagnosis of study was16 years.

H M Fenlon et al study mean duration since SLE was diagnosed were 5 years

Symptomatic and Asymptomatic Distribution

In the present study 22 patients (44%), were symptomatic and 28 patients were asymptomatic (56%).

In study by S Kakati et al out of 40 patients 9 were symptomatic (23.68%), and 31 patients were asymptomatic (77.5%)[1.]

In study by H M Fenlon et al 26 patients (77%) were asymptomatic and 8 patients (23%) were symptomatic[2].

In study by Donato Alarcon Segovia et al out of 48 patients 21 patients (44%) were symptomatic and 27 patients were asymptomatic[3].

Symptom Distribution

In the present study pleurisy was seen in 12 patients, dyspnea in 8 patients, cough in 4 patients and cough with expectoration in 2 patients.

In study by S Kakati et al out of 40 patients 6 had cough, 4 had dyspnea and 3 had pleurisy[1].

In study by Fenlon et al 6 patients had dyspnea, 1 had wheeze and 1 had pleurisy[2].

In study by Donato Alarcon Segovia cough was present in 21 patients, dyspnea in 18 patients, cough with expectoration in 14 patients, pleurisy in 12 patients and hemoptysis in 5 patients.

Disease Distribution

In our study pleuritis with effusion were present in 14 patients (28%), consolidation with effusion in 2 patients (4%), ILD in 13 patients (26%), pneumonitis in 3 patients (6%) and lymphadenopathy in 2 patients (4%).

In study by S Kakati et al pleural effusion in 4 patients(10.53%), ILD in 15 patients(39.47%), consolidation in 2 patients(5.26%), lymphadenopathy in 2 patients(5.26%) and bronchiectasis in 3 patients(7.8%)[1].

In study by Fenlon et al 11 patients(33%) had ILD, pleural effusion in 7 patients(21%), lymphadenopathy in 6 patients(18%), bronchiectasis in 7 patients(21%) and consolidation in 2 patients(6%)[2].

Lupus Nephritis Distribution

In our study lupus nephritis was present in 6 patients (12%) and absent in 44 patients (88%).IN S Kakati et al study lupus nephritis was present in 23 patients (69%) [1]

X ray, HRCT and Pulmonary Function Test Results Distribution

In our study X ray finding were present in 13 patients (26%). HRCT findings were present in 34 patients (68%). PFT was restrictive pattern in 7 patients (14%) and obstructive pattern in none.

In study S Kakati et al X ray findings were positive in 7 patients (18.42%). PFT had abnormality in 11 patients (28.95%). 10 had restrictive pattern (26.32%) and 1 had obstructive pattern (2.63%)[1]. HRCT findings were present in 21 patient s (55.26%).[1]

In study by Fenlon et al X ray finding were present in 8 patients(24%).HRCT was abnormal in 24 patients(70%).PFT had abnormality in 9 patients of which 6 had restrictive pattern and 3 had obstructive pattern.[2]

Symptomatic and Asymptomatic Disease Distribution in X ray, HRCT and PFT

In our study HRCT was abnormal in 34 patients (68%) out of which 20 were symptomatic and 14 were asymptomatic. Chest X ray was abnormal in 13 patients and all were symptomatic. PFT was abnormal in 7 patients out of which 3 patients were symptomatic and 4 were asymptomatic.

In S Kakati et al study 21 patients had abnormal HRCT findings (55.26%) out of which 9 were symptomatic and 12 were asymptomatic. Chest X ray

was abnormal in 7 patients who were symptomatic. PFT was abnormal in 11 patients out of which 7 were symptomatic and 4 were asymptomatic[1].

In study by Fenlon et al 24 patients had abnormal HRCT findings (70%) out of which 8 were symptomatic and 16 were asymptomatic. Chest X ray was abnormal in 8 patients and all were symptomatic. PFT was abnormal in 9 patients out of which 8 were symptomatic and 1 was asymptomatic.[2]

HRCT Findings

In our study pleural effusion was seen in 14 patients, consolidation with effusion in 2 patients, interstitial thickening in 13 patients, ground glass opacity in 11 patients, parenchymal bands in 2 patients and lymphadenopathy in 2 patients.

In S Kakati et al study pleural effusion was seen in 4 patients, thickened pleura in 1 patient, sub pleural band in 2 patients, lymphadenopathy in 2 patients, interstitial thickening in 15 patients, ground glass opacity in 10 patients, air space consolidation in 2 patients and bronchiectasis in 3 patients.[1]

In Fenlon et al study interstitial thickening in 15 patients, parenchymal bands in 15 patients, sub pleural bands in 7 patients, pleural effusion and thickening

in 7 patients, lymphadenopathy in 6 patients and ground glass opacity in 2 patients.[2]

LIMITATIONS

- The number of male patients taken up for study was low
- Results need to be confirmed in a larger group of patients and longitudinal groups.
- DLCO was not used to assess pulmonary function.

CONCLUSION

1) SLE and pulmonary manifestation is a common manifestation and it is not a rare manifestation

2) Pleural effusion with or without pleuritis and interstitial lung disease were of almost equal incidence still pleural effusion was slightly more common

3) Even in asymptomatic patient with normal chest x ray and pulmonary function, HRCT chest detected pulmonary involvement in significant number of cases

4) Thus it is important to do HRCT chest even with subtle clinical respiratory symptoms to detect early respiratory involvement and aggressively treat the respiratory manifestation without allowing it to develop into irreversible changes

5) To concentrate also on pulmonary manifestation of SLE like that of lupus nephritis and not to tapper the immunosuppressive agent dose just by monitoring nephritis but also by monitoring pulmonary manifestation

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PROFORMA

STUDY OF PULMONARY MANIFESTATIONS IN SYSTEMIC LUPUS ERYTHEMATOSUS

Name :
Age/Sex :
IP No :
Patient ID :

Symptoms
☐ Breathlessness
☐ Cough
☐ Expectoration
☐ Hemoptysis
☐ Pleuritic chest pain

Co-morbidities
☐ Allergy
☐ Asthma
☐ Tuberculosis
☐ COPD
☐ Non-lupus ILD

Examination
☐ Pallor
☐ Icterus
☐ Cyanosis
☐ Clubbing
☐ Lymphadenopathy
☐ Pedal edema

Respiratory system
Chest expansion: cm
☐ Chest symmetric
☐ Crackles
☐ Wheeze
☐ Pleural rub
Others:

Integuments
Skin:
Hair:
Nails:

Vitals
Pulse:
Blood pressure:
Respiratory rate:

Complete hemogram
TC :
DC :
ESR :
Hb :
PCV :
Platelets :
RBCs :

Liver function tests
Total bilirubin :
Direct bilirubin :
AST :
ALT :
ALP :
Total protein :
Albumin :

Renal function tests

Glucose :
Urea :
Creatinine :

Urinanalysis

☐ Albumin
☐ Sugar
Deposits :

Fasting lipid profile

Total cholesterol :
HDL :
LDL :
Triglycerides :

Sputum analysis

Immunology

RF :
ANA :
Anti-ds-DNA :
C3 :
C4 :
ACL : [IgM]
: [IgG]
LAC :

Imaging

Chest X-ray :

USG chest :

HRCT lung :

Cardiac evaluation

ECG :

ECHO :

Pulmonary function tests

INSTITUTIONAL ETHICS COMMITTEE
MADRAS MEDICAL COLLEGE, CHENNAI -3

Telephone No: 04425305301
Fax : 044 25363970

CERTIFICATE OF APPROVAL

To
Dr. Narayanaswamy .Y.N
PG in MD General Medicine
Madras Medical College, Chennai -3

Dear Dr. Narayanaswamy .Y.N

The Institutional Ethics Committee of Madras Medical College reviewed and discussed your application for approval of the proposal entitled "Study of Pulmonary manifestations in systemic lupus erythematosus" No. 15052012.

The following members of Ethics Committee were present in the meeting held on 30.05.2012 conducted at Madras Medical College, Chennai -3.

1.	Prof. S.K. Rajan, MD	-- Chairperson
2.	Prof. Pregna B. Dolia MD Vice Principal , Madras Medical College, Chennai -3 Director , Instt.of Bio Chemistry, MMC, Ch-3	-- Member Secretary
3.	Prof R. Nandhini, MD Director, Institute of Pharmacology, MMC, Ch-3	-- Member
4.	Prof. P. Karkuzhali MD Director i/c Prof & Head , Dept. of Pathology, MMC, Ch-3	-- Member
5.	Prof.A. Radhakrishnan MD Prof. of Internal Medicine, MMC, Ch-3	-- Member
6.	Prof. P. Raghumani MS Prof. of Surgery, Dept. of Surgery, MMC, Chennai -3	-- Member
7.	Thiru. S. Govindasamy . BA.BL	-- Lawyer
8.	Tmt. Arnold Soulina MA	-- Social Scientist

We approve the proposal to be conducted in its presented form.

Sd /. Chairman & Other Members

The Institutional Ethics Committee expects to be informed about the progress of the study, any SAE occurring in the course of the study, any changes in the protocol and patient information / informed consent and asks to be provided a copy of the final report

Member Secretary, Ethics Committee

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E-mail	narayanynkswamy@yahoo.co.in
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DISSERTATION TITLED “PULMONARY MANIFESTATIONS IN SYSTEMIC LUPUS ERYTHEMATOSUS” Submitted in partial fulfilment of Requirements for M.D.DEGREE EXAMINATION BRANCH-I INTERNAL MEDICINE THE TAMILNADU DR. M.G.R MEDICAL UNIVERSITY CHENNAI INSTITUTE OF INTERNAL MEDICINE MADRAS MEDICAL COLLEGE CHENNAI - 600003. APRIL 2013 CERTIFICATE This is to certify that the dissertation entitled “ A STUDY ON PULMONARY MANIFESTATIONS IN SYSTEMIC LUPUS ERYTHEMATOUS ” is a bonafide work done by DR. Y.N.NARAYANASWAMY, Post Graduate Student, Institute of Internal Medicine, Madras Medical College, Chennai-3, in partial fulfillment of the University Rules and Regulations for the award of MD Branch – I Internal Medicine,...

MASTER CHART

									CHEST X-RAY FINDINGS				HRCT FINDINGS									
ID	Age	Sex	Dyspnea	Cough	Hemoptysis	Pleurisy	Duration	Nephritis	XPleural Effusion	XReticular Opacities	XAtelectasis	XConsolidation	CT Pleural Effusion	CT Thickened Pleura	CT Interstitial Thickening	CT Bronchiectasis	CT Parenchymal Bands	CT Ground Glass Opacities	CT Consolidation	CT Lympha-denopathy	PFT	Sputum
1	40	F	Y	N	N	N	12	N	N	Y	N	N	N	N	Y	N	Y	Y	N	N	Restrictive	-
2	36	F	Y	Y	N	N	11	N	N	Y	N	N	N	N	Y	N	Y	Y	N	N	Restrictive	-
3	35	M	Y	Y	N	N	15	N	N	N	N	N	N	N	N	N	N	Y	N	N	Normal	-
4	40	F	Y	Y	N	N	15	N	N	N	N	N	N	N	N	N	N	Y	N	N	Normal	-
5	46	F	Y	Y	N	N	16	N	N	N	N	N	N	N	N	N	N	Y	N	N	Normal	-
6	51	F	Y	N	N	N	26	N	N	Y	N	N	N	N	Y	N	N	N	N	N	Restrictive	-
7	25	M	N	Y	N	Y	6	Y	Y	N	N	Y	Y	N	N	N	N	N	Y	Y	Normal	+
8	30	F	N	Y	N	Y	8	N	Y	N	N	N	Y	N	N	N	N	N	Y	Y	Normal	+
9	30	F	Y	N	N	N	9	Y	N	N	N	N	N	N	N	N	N	N	N	N	Normal	-
10	38	F	Y	N	N	N	11	N	N	N	N	N	N	N	N	N	N	N	N	N	Normal	-
11	41	F	N	N	N	Y	14	N	Y	N	N	N	Y	N	N	N	N	N	N	N	Normal	-
12	34	M	N	N	N	Y	7	N	Y	N	N	N	Y	N	N	N	N	N	N	N	Normal	-
13	36	F	N	N	N	Y	8	N	Y	N	N	N	Y	N	N	N	N	N	N	N	Normal	-
14	35	F	N	N	N	Y	12	N	Y	N	N	N	Y	N	N	N	N	N	N	N	Normal	-
15	28	M	N	N	N	Y	10	N	Y	N	N	N	Y	N	N	N	N	N	N	N	Normal	-
16	21	F	N	N	N	Y	6	N	Y	N	N	N	Y	N	N	N	N	N	N	N	Normal	-
17	25	F	N	N	N	Y	7	N	Y	N	N	N	Y	N	N	N	N	N	N	N	Normal	-
18	29	F	N	N	N	Y	7	N	Y	N	N	N	Y	N	N	N	N	N	N	N	Normal	-
19	32	F	N	N	N	Y	10	N	N	N	N	N	Y	N	N	N	N	N	N	N	Normal	-
20	33	F	N	N	N	Y	6	N	N	N	N	N	Y	N	N	N	N	N	N	N	Normal	-
21	38	F	N	N	N	Y	8	N	N	N	N	N	Y	N	N	N	N	N	N	N	Normal	-
22	39	F	N	N	N	Y	9	N	N	N	N	N	Y	N	N	N	N	N	N	N	Normal	-
23	27	F	N	N	N	N	7	N	N	N	N	N	N	N	N	N	N	N	N	N	Normal	-

									CHEST X-RAY FINDINGS				HRCT FINDINGS									
ID	Age	Sex	Dyspnea	Cough	Hemoptysis	Pleurisy	Duration	Nephritis	XPleural Effusion	XReticular Opacities	XAtelectasis	XConsolidation	CT Pleural Effusion	CT Thickened Pleura	CT Interstitial Thickening	CT Bronchiectasis	CT Parenchymal Bands	CT Ground Glass Opacities	CT Consolidation	CT Lympha-denopathy	PFT	Sputum
24	40	F	N	N	N	N	12	N	N	N	N	N	N	N	N	N	N	N	N	N	Normal	-
25	39	F	N	N	N	N	11	Y	N	N	N	N	Y	N	N	N	N	N	N	N	Normal	-
26	28	F	N	N	N	N	8	Y	N	N	N	N	Y	N	N	N	N	N	N	N	Normal	-
27	31	F	N	N	N	N	9	N	N	N	N	N	N	N	N	N	N	N	N	N	Normal	-
28	48	F	N	N	N	N	21	N	N	N	N	N	N	N	Y	N	N	N	N	N	Normal	-
29	48	F	N	N	N	N	24	N	N	N	N	N	N	N	Y	N	N	N	N	N	Normal	-
30	45	F	N	N	N	N	22	N	N	N	N	N	N	N	Y	N	N	Y	N	N	Normal	-
31	46	F	N	N	N	N	27	N	N	N	N	N	N	N	Y	N	N	Y	N	N	Normal	-
32	54	F	N	N	N	N	25	N	N	N	N	N	N	N	Y	N	Y	Y	N	N	Restrictive	-
33	49	F	N	N	N	N	23	N	N	N	N	N	N	N	Y	N	Y	Y	N	N	Restrictive	-
34	50	F	N	N	N	N	25	N	N	N	N	N	N	N	Y	N	Y	Y	N	N	Restrictive	-
35	51	F	N	N	N	N	24	N	N	N	N	N	N	N	Y	N	N	Y	N	N	Restrictive	-
36	47	F	N	N	N	N	22	N	N	N	N	N	N	N	Y	N	N	N	N	N	Normal	-
37	45	F	N	N	N	N	20	N	N	N	N	N	N	N	Y	N	N	N	N	N	Normal	-
38	37	F	N	N	N	N	20	N	N	N	N	N	N	N	N	N	N	N	N	N	Normal	-
39	39	F	N	N	N	N	19	N	N	N	N	N	N	N	N	N	N	N	N	N	Normal	-
40	50	F	N	N	N	N	21	N	N	N	N	N	N	N	N	N	N	N	N	Y	Normal	-
41	51	F	N	N	N	N	19	N	N	N	N	N	N	N	N	N	N	N	N	Y	Normal	-
42	32	F	N	N	N	N	12	N	N	N	N	N	N	N	N	N	N	N	N	N	Normal	-
43	33	F	N	N	N	N	12	N	N	N	N	N	N	N	N	N	N	N	N	N	Normal	-
44	39	F	N	N	N	N	11	N	N	N	N	N	N	N	N	N	N	N	N	N	Normal	-
45	37	F	N	N	N	N	10	N	N	N	N	N	N	N	N	N	N	N	N	N	Normal	-
46	35	F	N	N	N	N	12	N	N	N	N	N	N	N	N	N	N	N	N	N	Normal	-
47	33	F	N	N	N	N	13	Y	N	N	N	N	N	N	N	N	N	N	N	N	Normal	-
48	32	F	N	N	N	N	9	Y	N	N	N	N	N	N	N	N	N	N	N	N	Normal	-

									CHEST X-RAY FINDINGS				HRCT FINDINGS									
ID	Age	Sex	Dyspnea	Cough	Hemoptysis	Pleurisy	Duration	Nephritis	XPleural Effusion	XReticular Opacities	XAtelectasis	XConsolidation	CT Pleural Effusion	CT Thickened Pleura	CT Interstitial Thickening	CT Bronchiectasis	CT Parenchymal Bands	CT Ground Glass Opacities	CT Consolidation	CT Lympha-denopathy	PFT	Sputum
49	31	F	N	N	N	N	10	N	N	N	N	N	N	N	N	N	N	N	N	N	Normal	-
50	38	F	N	N	N	N	11	N	N	N	N	N	N	N	N	N	N	N	N	N	Normal	-

KEY WORDS

F- Female
M- Male
Y- Yes
N- No
+- Positive
(-) Negative